K-FLEX USA
INNOVATION IN INSULATION

PLUMBING HVAC/R COMMERCIAL/INDUSTRIAL MARINE OIL&GAS SOLAR

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GENERAL CATALOG

K-FLEX USA Products and Accessories

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K-FLEX USA
INNOVATION IN INSULATION

K-FLEX USA is a member of the IK Insulation Group, a world leader in elastomeric foam insulation production and distribution, encompassing 43 countries and 14 production facilities.

K-FLEX USA MEMBER OF THE IK INSULATION GROUP

K-FLEX USA's manufacturing headquarters in Youngsville, NC.

K-FLEX USA IS A LEADING MANUFACTURER of elastomeric, closed cell insulation. We ensure our customers' satisfaction by providing superior products with a systematic approach. Exceptionally innovative and adaptive, K-FLEX USA partners with our customers to provide solutions to insulation challenges.

K-FLEX USA'S MISSION is to drive the growth and innovation of the North American elastomeric insulation market through a commitment to:
Our customers - by providing reliable, sustainable, and easy-to-use products.
Our associates - by empowering them and providing them with a safe, secure, and rewarding work environment.
Our community and environment - by being a socially responsible corporate citizen.

K-FLEX USA PRODUCTS HAVE DELIVERED EXCELLENT PERFORMANCE in many applications, including: HVAC/R, Commercial/Industrial, Oil and Gas, Plumbing, Marine, Solar, and Original Equipment Manufacturers (OEM).

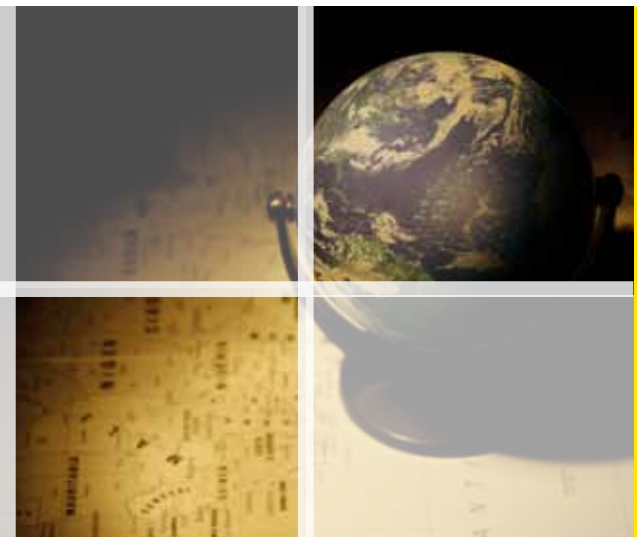
AS A MEMBER OF THE IK INSULATION GROUP, K-FLEX USA has global access to strong fundamental research programs and state-of-the-art levels of technical knowledge and customer support specifically related to thermal and acoustical elastomeric insulation.

COMPANY HISTORY

1965
Rubatex was formed.

1975
Halstead was formed and INSUL-TUBE® became a well-known product brand.

1989
L'Isolante K-FLEX was formed.



GLOBAL PRESENCE

L'ISOLANTE K-FLEX has 14 production facilities located in:

- **Italy** (Roncello - Headquarters)
- **Russia**
- **China** (4 plants)
- **Turkey**
- **USA**
- **Poland**
- **Dubai**
- **India**
- **Iran**
- **Malaysia**
- **UAE**

L'ISOLANTE K-FLEX also has commercial distribution branches in Spain, Norway, Germany, France, United Kingdom, Russia, Ukraine, Singapore, Australia, Egypt, Czech Republic / Slovakia, Baltic States, Romania and Japan.

1999
Rubatex acquires Halstead to form RBX Industries.

2001
Nomaco Insulation and L'Isolante K-FLEX join to form Nomaco K-FLEX (NKF).

2002
NKF enters into a Sales and Marketing Agreement with RBX Industries.

2004
NKF acquires RBX's mechanical insulation business.

2008
Jan. 10, 2008 L'Isolante K-FLEX redeems Nomaco shares in NKF and goes to market as K-FLEX USA.

K-FLEX USA MARKETS INNOVATION IN INSULATION

HEATING AND PLUMBING

Products and solutions for the plumbing sector, designed specifically for sanitaryware distributors.

HVAC/R

Products used to insulate piping, equipment and air handling units for the distribution of air conditioning and refrigeration.

COMMERCIAL/INDUSTRIAL

Products for high-performance on equipment, vessels, ducts or large pipes typically found in the marine, oil, rail and process industries (chemical, petrochemical and pharmaceutical).

MARINE

Halogen-free products for use on applications where corrosive smoke and environmental issues are critical, specifically piping, vessels and duct work on military ships, the general maritime industry and other industrial applications.

OIL & GAS

Products well-suited for extreme condition applications with rapid temperature cycles, including industrial plants, offshore platforms, FPSOs, LNG Terminals, and shipbuilding.

SOLAR THERMAL

Products for fluid recirculation lines connecting solar panels and water storage tanks in residential and commercial facilities.

O. E. M.

Products for thermal and acoustical insulation for original equipment manufacturers (OEM).

ACOUSTIC

Products designed to absorb and block noise from transmitting from one area to another. Well-suited for equipment rooms, machine covers, piping, and floor underlayment.

PERFORMANCE FOAM

Products designed for superior performance in gasketing, sealing, insulation, general padding and cushioning applications.

LOGISTICS AND DISTRIBUTION

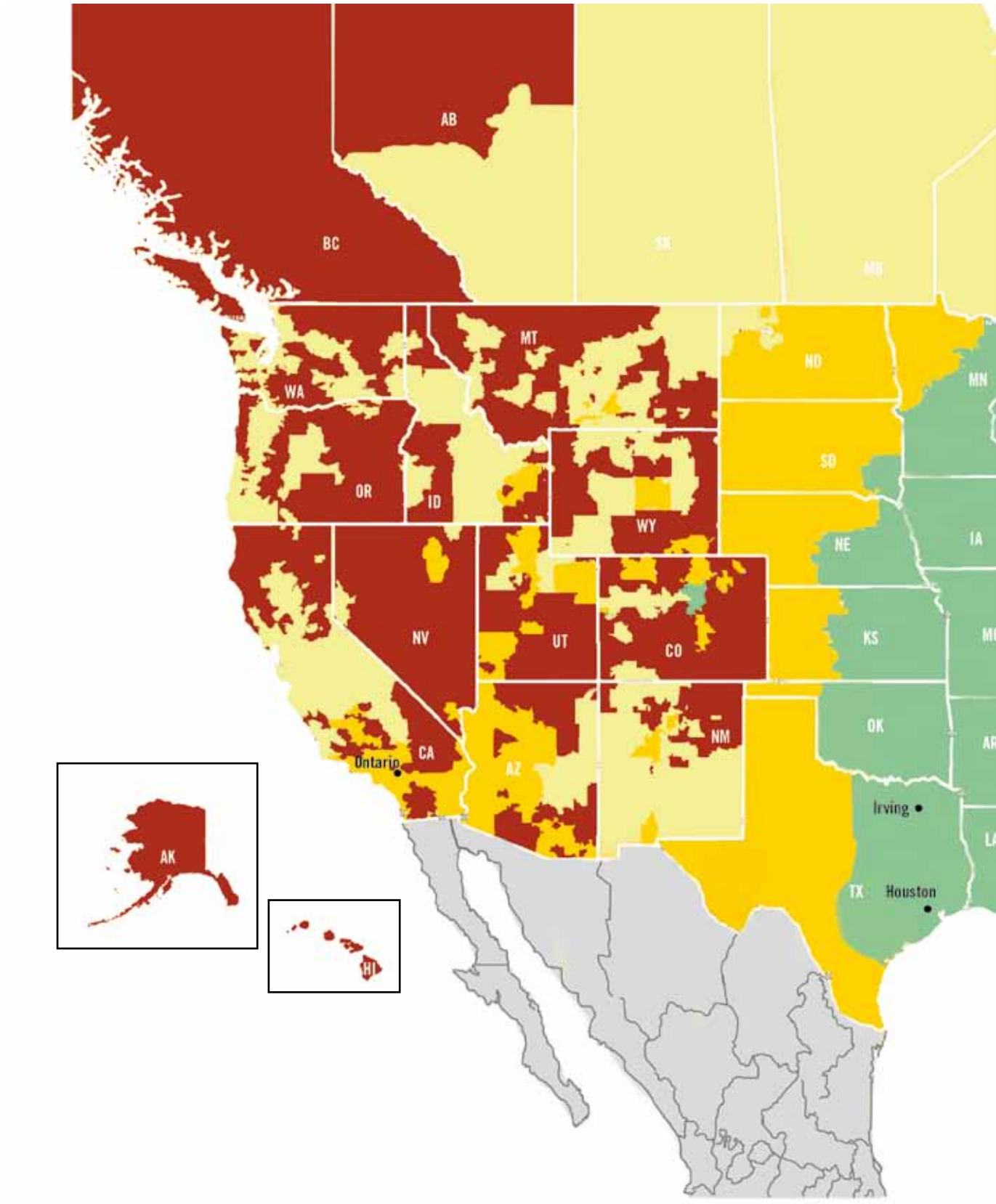
SUPPLY CHAIN AT K-FLEX USA

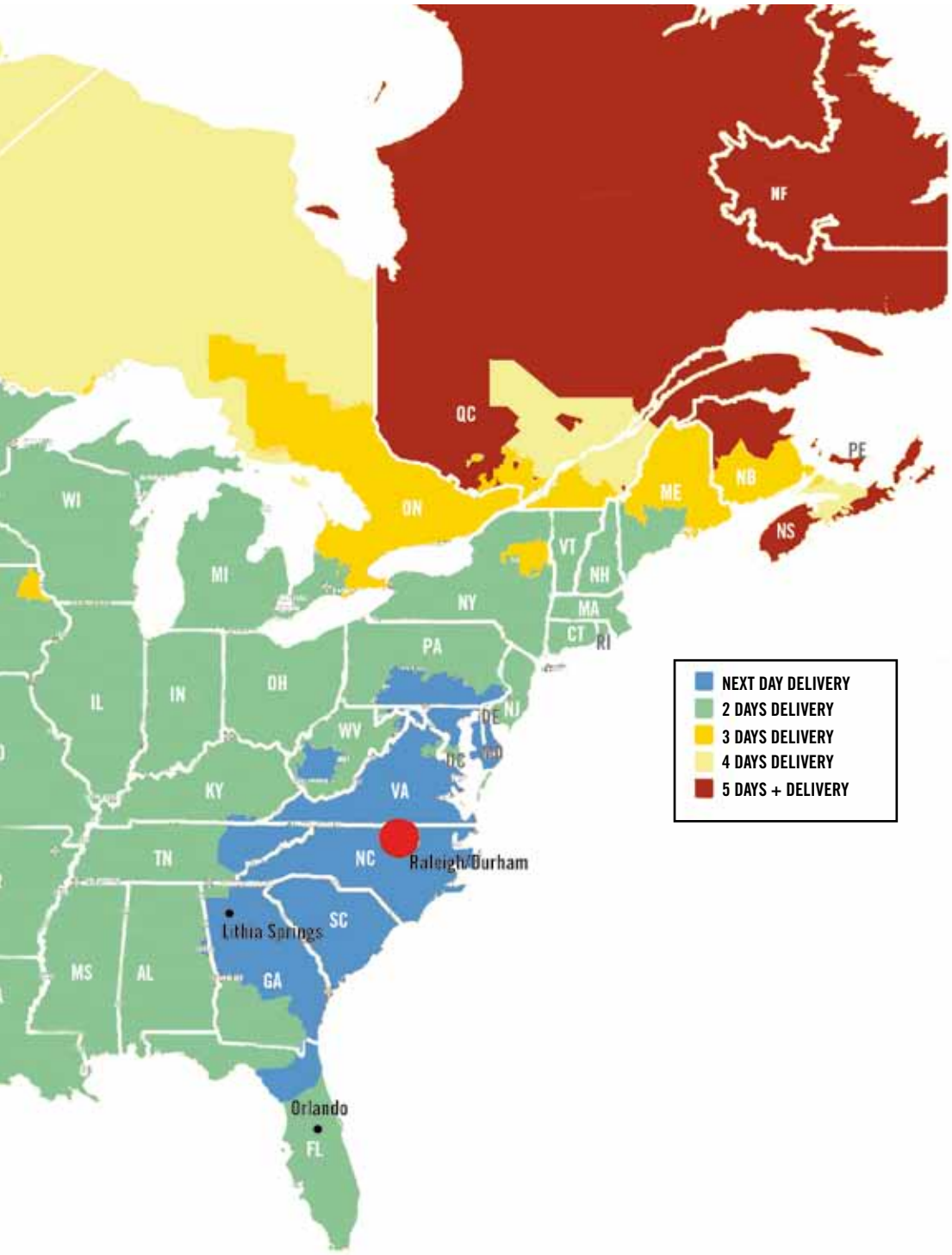
Currently we have 6 distribution centers throughout North America to ensure we can achieve the desired transit times to our customers. It is critical that we have the flexibility to react expeditiously to our customer's demands.

We have a high concentration in our Research & Development division to proactively develop and expand our product offerings, which will support our customer's continuous growth. Innovation and automation are areas of focus for our manufacturing operations to enhance our safety, quality, productivity and efficiencies in an effort to continue as the leader in this industry.

Our #1 asset is our associates and we will continue the growth and development of our associates by investing in them to support K-FLEX USA's efforts in hiring and retaining the best individuals to lead this company.

DISTRIBUTION SHIPPING FROM YOUNGSVILLE*





* We also carry limited offering of pipe insulation and accessories in other distribution centers that are strategically located in the US. For accurate information regarding your shipment, please contact our customer service at 1-800-765-6475.

K-FLEX IN THE WORLD DISTRIBUTION AND PRODUCTION NETWORK

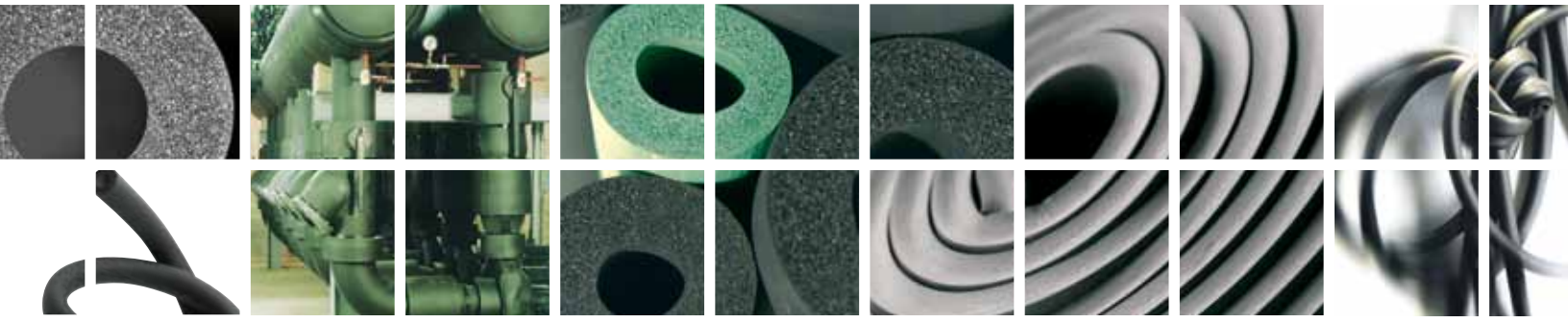
EUROPE
- ALBANIA
- AUSTRIA
- BALTIC REPUBLICS
- BELARUS
- BELGIUM
- BOSNIA-HERZEGOVINA
- BULGARIA
- CROATIA
- CZECH REPUBLIC
- DENMARK
- FINLAND
- FRANCE
- GERMANY
- GREECE
- HUNGARY
- IRELAND
- ITALY
- LUXEMBOURG
- MACEDONIA
- MALTA
- MONTENEGRO
- NETHERLANDS
- NORWAY
- POLAND
- PORTUGAL
- ROMANIA
- RUSSIA
- SERBIA
- SLOVAKIA
- SLOVENIA
- SPAIN
- SWEDEN
- SWITZERLAND
- SYRIA
- TURKEY
- UK
- UKRAINE

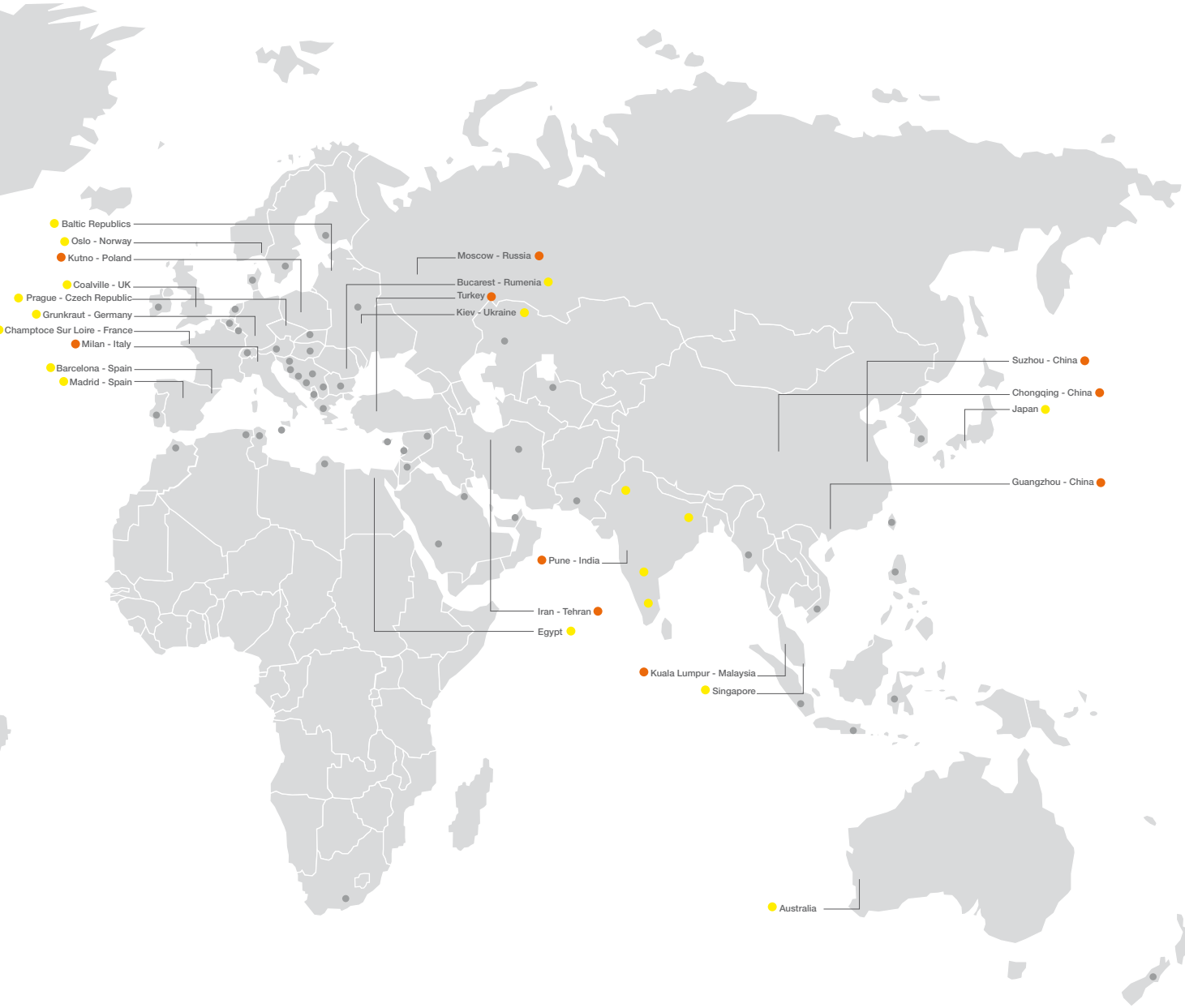
ASIA
- AZERBAIJAN
- CHINA
- CYPRUS
- DUBAI
- INDIA
- IRAN
- ISRAEL
- JAPAN
- JORDAN
- KAZAKHSTAN
- LEBANON
- MALAYSIA
- SINGAPORE
- SOUTH KOREA
- TAIWAN
- UAE
- UZBEKISTAN

AFRICA
- ALGERIA
- EGYPT
- LIBYA
- MOROCCO
- SOUTH AFRICA
- TUNISIA

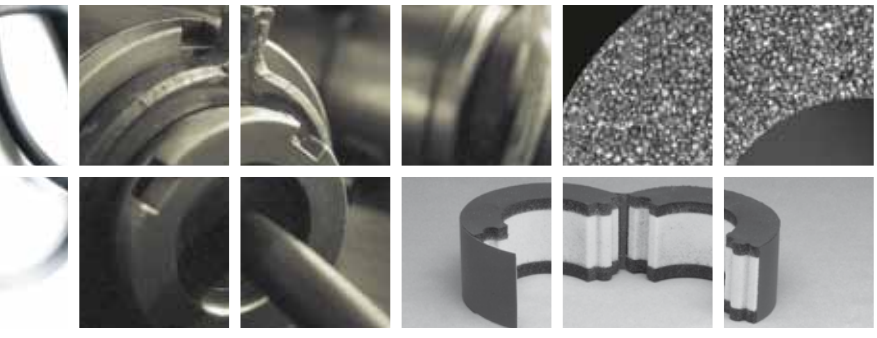
AMERICA
- ARGENTINA
- BRAZIL
- CANADA
- CHILE
- CUBA
- MEXICO
- URUGUAY
- USA
- VENEZUELA

OCEANIA
- AUSTRALIA
- NEW ZEALAND



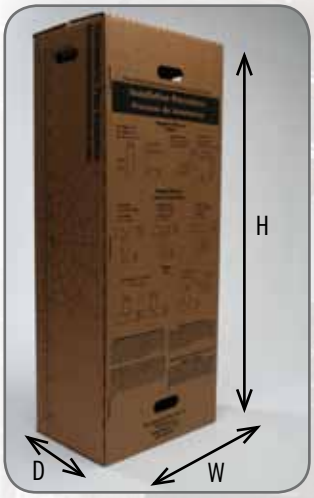


Production Site Sales Office Distribution Areas



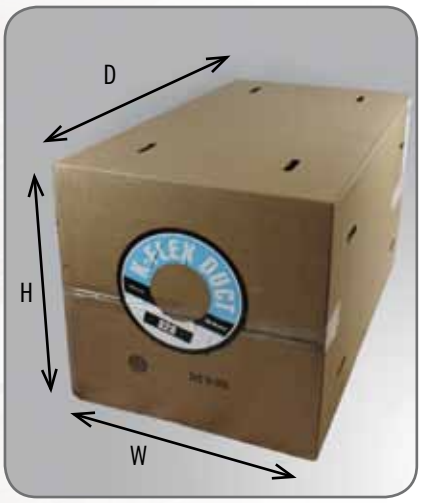
K-FLEX USA PACKAGING

INSUL-TUBE®, K-FLEX CLAD® and K-FLEX DUCT® LINER GRAY:



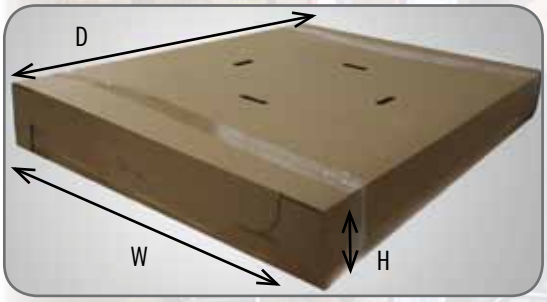
6' Tubes: *H: 74", W: 16", D: 11"*
3' Tubes: *H: 38", W: 19", D: 19"*

3' Tubes: *H: 37", W: 19", D: 19"*



Small Duct Liner: *H: 30", W: 30", D: 53-1/8"*
Large Duct Liner: *H: 30", W: 30", D: 64-1/8"*

INSUL-SHEET®/K-FLEX CLAD® SHEET, INSUL-SHEET®-Rolls, and INSUL-TUBE® COIL:



Flat sheets: *H: 6-15/16", W: 52-1/2", D: 65-1/32"*

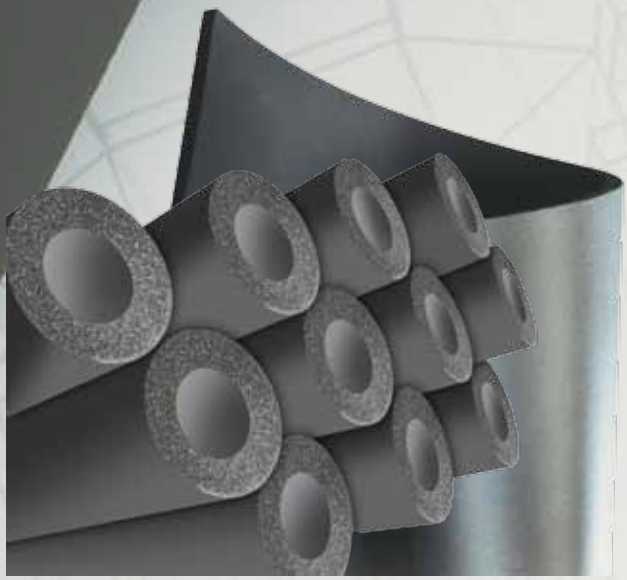
Rolls: *H: 53-1/8", W: 30", D: 30"*

Medium Coil: *H: 13", W: 30", D: 30"*
Large Coil: *H: 33-1/8", W: 45-1/4", D: 39-1/4"*

K-FIT®

Fittings: *H: 8", W: 6", D: 8"*
Fittings: *H: 13", W: 7-1/5", D: 13"*
Fittings: *H: 10", W: 10", D: 10"*
Fittings: *H: 12", W: 12", D:12 "*
Fittings: *H: 15", W: 15", D: 15"*
Fittings: *H: 18", W: 18", D: 18"*

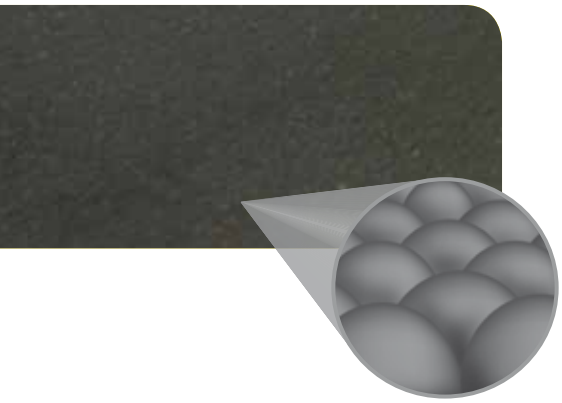
TECHNICAL SPECIFICATIONS OF OUR PRODUCTS



This section describes the technical characteristics of our products to enable an understanding of the quality aspects of insulation materials. Concepts such as closed cell structure, thermal conductivity, water vapor transmission and - in general - the technical features of our materials are explained as an introductory guide. There is also a detailed explanation of the different types of materials that we produce: pipe and sheet insulation, tapes and insulating supports, and insulation systems.

K-FLEX USA
INNOVATION IN INSULATION

PHYSICAL PROPERTIES PERFORMANCE CHARACTERISTICS



CLOSED CELL STRUCTURE

Closed cell elastomeric insulation products have comparative advantages over traditional open cell products made of wool or fiberglass, particularly in below ambient applications, including:
- Stronger system integrity: Lower water vapor diffusion ensures long-term low thermal conductivity without the use of protective coatings/jacketing on indoor applications. Open cell products require a jacket that, if punctured, could cause the insulation system to fail.
- Nonconnecting cell structure inherently resists mold and bacterial growth, because of an inability to spread within the structure.
- Elastomeric composition creates excellent flexibility for easy installation.
- Fiber-free formulation ensures that no particles or contaminants are released into the operating environment during installation or operation.

RESISTANT TO WATER VAPOR TRANSMISSION

Water vapor transmission rate refers to the steady water vapor flow through the area of a body. Materials with a wvt of 0.10 perms-in or less are considered to be moisture vapor retarders as defined by ASHRAE and ASTM. Elastomeric products achieve this wvt value without the addition of a jacket. Fibrous products require a jacket (concentrated vapor barrier) to achieve this, but if the jacket is punctured or torn from mechanical abuse, the wvt value increases substantially, possibly resulting in system failure. In addition, moisture intrusion can result in the growth of mold and fungi on or in the material. Elimination of moisture is a key to the elimination of mold. Because the thermal conductivity of water is approximately 15 times higher than typical insulation, any absorption of water vapor could reduce the insulation efficiency.

NON-TOXIC PRODUCTS

Many insulation materials are porous or fibrous where the presence of moisture and organic matter allows the growth of bacteria, mold and fungi. K-FLEX USA products are resistant to this and, as a result, contribute to the quality of the air that we breath. To ensure that our products do not emit VOCs (volatile organic compounds), we use RoHS-compliant ingredients and utilize state-of-the-art production processes. K-FLEX USA products are GREENGUARD-certified as low VOC materials, meeting the requirements of the “Children & Schools” and “Indoor Air Quality” classifications. L’Isolante K-FLEX is certified by a similar EU-based organization for producing products that are completely harmless with regard to the emission of air-born substances. The fiber-free formulation of elastomeric insulation eliminates the release of harmful particles into the air, making it an ideal product for use in public buildings, schools, hospitals, and clean room applications where minimum dust and the absence of pollutants are a necessity for efficient production processes.

FLAMMABILITY

All K-FLEX USA products are tested for flame spread and smoke development according to ASTM E84 test method, “Surface Burning Characteristics of Building Materials”. Reference specific product pages for compliance with the 25/50-rating.

FLEXIBILITY AND EASE OF USE

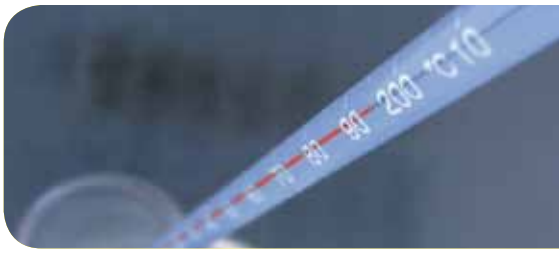
The ease of installation of our materials sets them apart from other products on the market. Due to its flexibility, K-FLEX elastomeric insulation is ideal for a variety of applications, including air conditioning ducts, pipes, elbows, valves, and flanges. Professionals will also appreciate its cleanliness as it does not leave traces and residues during installation. Restoration and maintenance work can also be completed with ease, resulting in installation time and cost savings that is unique compared to other materials.

QUALITY & SAFETY

Our materials are well-suited for applications in environments where strict testing and international approvals are necessary. This includes general construction, marine, mass transit, oil, pharmaceutical and clean-room applications, among others.

TEMPERATURE RANGE

Our materials are well-suited for applications across a wide range of temperatures. Reference individual product pages for specific temperature ranges.



THERMAL CONDUCTIVITY (k FACTOR)

Thermal conductivity is a measurement of the ability of a material to transmit heat, specifically the measure of heat in Btus that pass through one square foot of a homogenous substance, 1 inch thick, in 1 hour, for each degree Farenheit temperature difference. The lower the k-value, the higher the insulating value. Most insulation products have a k-value in the range of 0.23 – 0.30 and would all be considered excellent insulators.

PRODUCT CATEGORIES

TUBES, SHEETS, ROLLS


Tubes available in 6' lengths and coils.


Sheets


Rolls

ACCESSORIES, FITTINGS ETC.


Self-Adhesive Tapes


Insulating Pipe Supports


Elbow

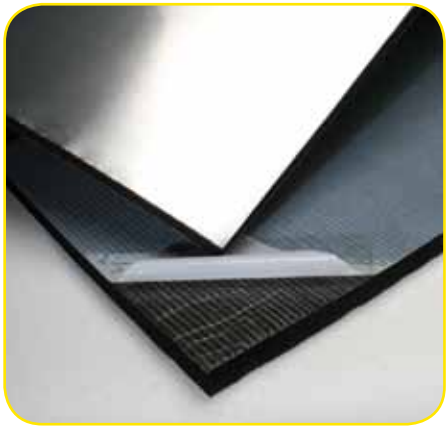

"T" Fittings

Preformed fittings (Elbow, "T", reductions, valves, flanges etc...)

ADHESIVE PRODUCTS


Pre-slit pipe insulation with a special pressure sensitive adhesive (PSA)


Self adhesive flexible elastomeric sheets/rolls.

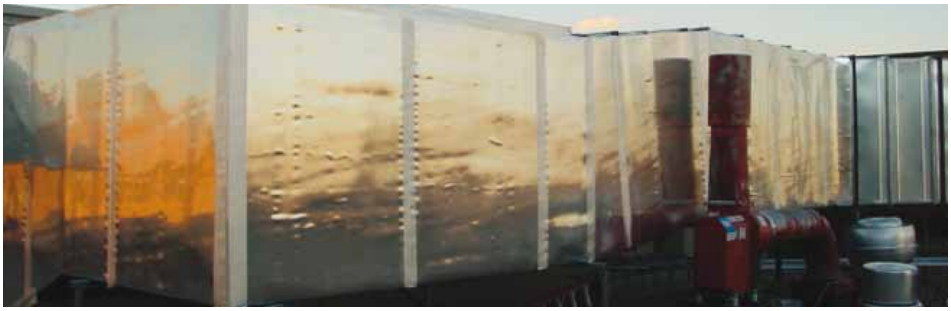

K-FLEX Clad® with PSA in sheet or roll form.

COMMERCIAL & INDUSTRIAL PROJECTS

Our products have delivered lasting performance on jobs in North America and throughout the world. This serves true for applications using our standard tubing and duct lining to those featuring our factory-applied cladding and noise control products.

Applications:
Monza Racing Track, Italy
Volkswagen, Wolfsburg, Germany
Disneyland, Paris, France
Emirates Tower, Dubai, UAE
Daimler Chrysler, Rastadt, Germany
University, Düsseldorf, Germany
IBM, Segrate, Italy
Brookshire Grocery Stores, TX, USA
Bellefonte High School, PA, USA

The Renaissance on Charleston Harbor, SC

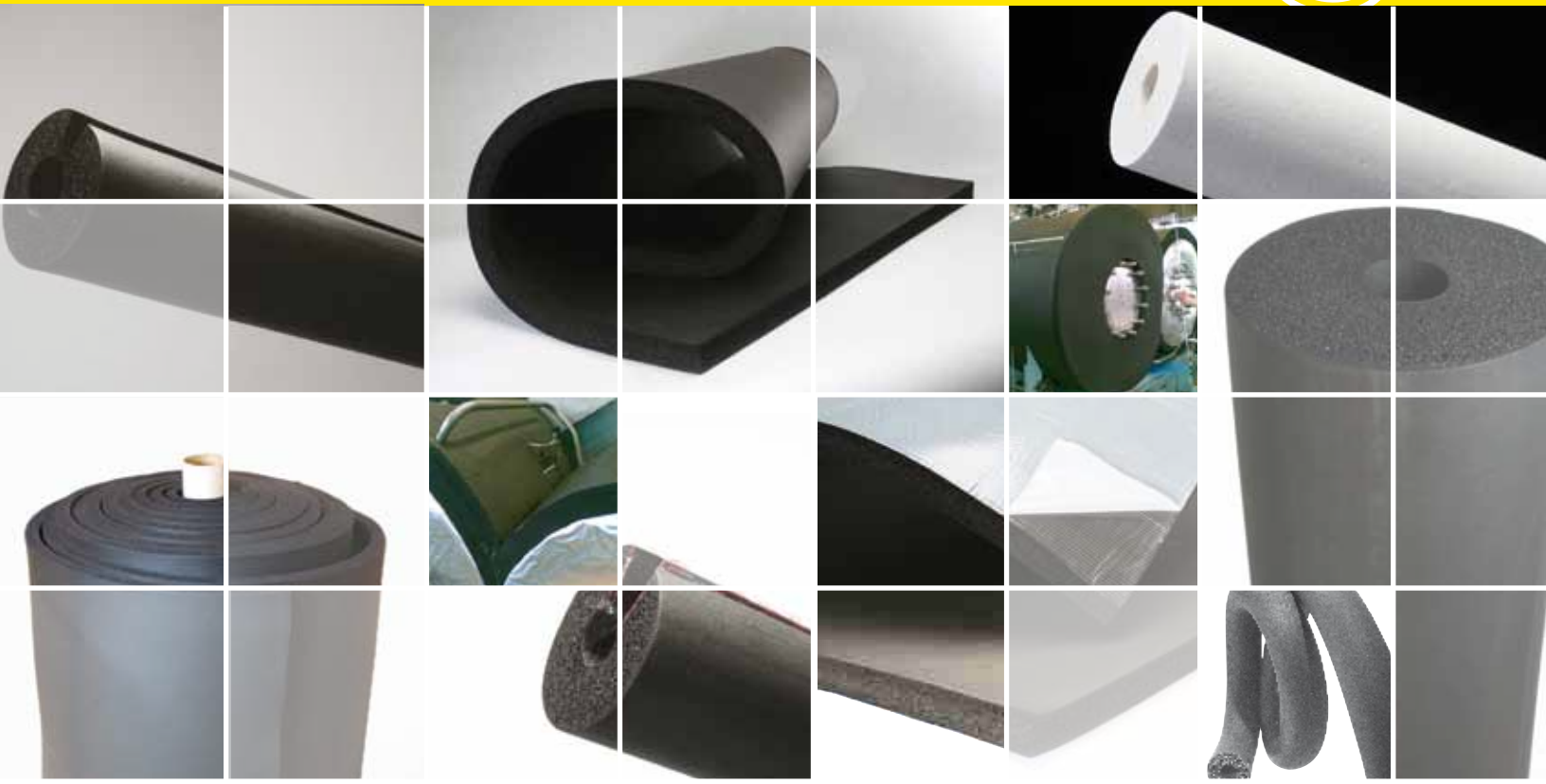


Centura Avista Adventist Hospital, CO

Duke University Smart House, NC

Little Village High School, IL

PRODUCT RANGE



INSUL-TUBE®, INSUL-LOCK®, INSUL-SHEET® Tubes, Sheets, and Rolls

INSUL-TUBE®, INSUL-LOCK®, INSUL-SHEET®

Elastomeric insulation for HVAC and Refrigeration applications.

APPLICATIONS:

- Air-conditioning
- Refrigeration
- Chilled Water
- Hot / Cold Water
- OEM
- Dual Temperature Piping

INSUL-TUBE®, INSUL-LOCK®, INSUL-SHEET® CLOSED CELL, ELASTOMERIC INSULATION improves thermal and acoustical performance on mechanical piping, equipment and air handling systems, and is fundamental to energy efficiency and lower operating costs.

INSUL-TUBE®/INSUL-LOCK® DESIGNED FOR THE HVAC/R INDUSTRY

INSUL-TUBE®

INSUL-TUBE® flexible, fiber-free insulation prevents condensation, frost formation and heat/loss gain to create durable, energy-efficient HVAC systems. Its closed cell structure and tough skin inherently resists mold growth without the need for a jacket to provide these properties.

Temperature Range: -297°F to 220°F (-182°C to 104°C).

COVERINGS AND COATINGS

See details in the specific sections

K-FLEX CLAD® AL
K-FLEX CLAD® WT
K-FLEX CLAD® IN

RANGE

	LENGTH:	THICKNESS:	ID:
TUBES	3 and 6 ft	3/8” to 2”	3/8” to 8-5/8”

INSUL-LOCK®

INSUL-LOCK® Seam-Seal is pre-slit elastomeric insulation with a factory-applied pressure-sensitive adhesive. The innovative technology saves on installation time, reduces the use of contact adhesives, and is flexible and easy to install even at low temperatures.

Temperature range: -70°F to 200°F (-57°C to 93°C).

RANGE

	LENGTH:	THICKNESS:	ID:
TUBES	3 and 6 ft	3/8” to 1”	3/8” to 4-1/2”

INSUL-TUBE® TECHNICAL INFORMATION

UL 94 (Recognition No. E300774)

UV resistant Refer to K-Flex USA L.L.C. Technical Bulletin (Outdoor Applications) for More Information

FM APPROVED

Made in USA

Contains a Protective Antimicrobial Agent

GREENGUARD Children & Schools Indoor Air Quality Certified

DESCRIPTION

INSUL-TUBE® pipe insulation is an environmentally friendly, CFC-free, flexible elastomeric thermal insulation. It is black in color and is available in unslit tubular form in wall thicknesses of 3/8",1/2", 3/4", 1", 1-1/4", 1-1/2" or 2" in sizes ranging from 3/8" I.D. to 8" IPS. (Available in six foot lengths and coils).

INSUL-TUBE® key physical properties are approved through supervision by *Factory Mutual Research Corporation*. INSUL-TUBE® 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-TUBE® is *GREENGUARD®* certified as a low VOC material, meeting the requirements of the *"Children & Schools"* and *"Indoor Air Quality"* classifications.

APPLICATIONS

INSUL-TUBE® is used to retard heat gain and prevent condensation or frost formation on refrigerant lines, cold water plumbing, and chilled water systems. It also retards heat flow for hot water plumbing, liquid heating, dual temperature piping, and many solar systems. INSUL-TUBE® is designed for the HVAC and Refrigeration industry. INSUL-TUBE® is recommended for applications ranging from -297°F to 220°F (-182°C to 104°C). The expanded closed cell structure makes INSUL-TUBE® an efficient insulator and provides effective moisture vapor resistance. INSUL-TUBE® can be used with heat tracing/heat tapes.

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

INSTALLATION

With a factory-applied coating of talc on the smooth inner surface, INSUL-TUBE® slides easily over pipe or tubing for quick installation. When applied to existing lines, tubing is slit lengthwise and fitted into place. (Slitting can be done on the job with a sharp knife or pre-slit INSUL-TUBE® is available on request). All seams and butt joints should be sealed with an approved contact adhesive, making sure both surfaces to be joined are coated with adhesive. Fittings are fabricated from miter-cut tubular sections, and cover, flanges, etc., from INSUL-SHEET®. K-FIT® factory fabricated fittings are also available. ASTM C1710, *Installation Guide for Flexible Closed Cell Foams*, should be used as an installation guide.

OUTDOOR APPLICATIONS

INSUL-TUBE® is made from a UV-resistant elastomeric blend. For moderate UV exposure (residential applications), no additional protective coating is needed. For severe outdoor exposure (rooftop applications), K-FLEX® 374 Protective Coating, approved jacketing or K-FLEX Clad® AL is recommended.

UNDERGROUND

For buried lines above the water table, use a clean fill such as sand (3"-5" layer) to protect INSUL-TUBE® before backfilling. It is recommended that materials to be buried are properly sealed at all seams and butt joints with an approved contact adhesive. For optimum performance, the lines should be encased in a conduit to protect them from problems associated with ground water intrusion and compaction.

RESISTANCE TO MOISTURE VAPOR FLOW

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

FLAME AND SMOKE RATING

INSUL-TUBE® in wall 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 E84, "Surface Burning Characteristics of Building Materials". INSUL-TUBE® is acceptable for 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.

PYHSICAL PROPERTIES		INSUL-TUBE®	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/C 518 ASTM C 177/C 518
Density		3-6 PCF	ASTM D 1622/D 3575
Operating Temperature Range Flexible to -40°F (-40°C)	Upper Lower	220°F (104°C) -297°F (-182°C)	
Water Vapor Permeability Dry Cup. Perm-In		0.03	ASTM E 96
Water Absorption %		<0.20 by volume	ASTM C 209
Flame Spread (up to 2" wall)		Not greater than 25	ASTM E 84
Smoke Developed (up to 2" wall)		Not greater than 50	ASTM E 84
Ozone Resistance		Pass	ASTM D 1171
Chemical/Solvent Resistance		Good	
Mildew Resistance/Air Erosion		Pass	UL 181
UV Weather Resistance		Pass	QUV Chamber Test

THICKNESS RECOMMENDATIONS* - TO CONTROL CONDENSATION								
	LINE TEMP		LINE TEMP		LINE TEMP		LINE TEMP	
PIPE SIZE	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.)								
3/8" I.D. thru 1-3/8" I.D.	3/8"	10 mm	1/2"	13 mm	3/4"	19 mm	1"	25 mm
Over 1-3/8" thru 3" IPS	3/8"	10 mm	1/2"	13 mm	1"	25 mm	1"	25 mm
Over 3" IPS thru 4" IPS	1/2"	13 mm	1/2"	13 mm	1"	25 mm	1-1/2"	38 mm
Over 4" IPS	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.)								
3/8" I.D. thru 2-1/8" I.D.	3/8"	10 mm	3/8"	10 mm	1/2"	13 mm	1/2"	13 mm
Over 2-1/8" thru 3" IPS	3/8"	10 mm	3/8"	10 mm	1/2"	13 mm	3/4"	19 mm
Over 3" IPS thru 4" IPS	1/2"	13 mm	1/2"	13 mm	3/4"	19 mm	3/4"	19 mm
Over 4" IPS	1/2"	13 mm	1/2"	13 mm	3/4"	19 mm	3/4"	19 mm
Severe Conditions (Max 90°F, 32°C - 80% RH)								
3/8" I.D. thru 1-1/8" I.D.	3/4"	19 mm	3/4"	19 mm	1-1/2"	38 mm	1-1/2"	38 mm
Over 1-1/8" I.D. thru 4" IPS	3/4"	19 mm	1"	25 mm	1-1/2"	38 mm	1-1/2"	38 mm
Over 4" IPS	3/4"	19 mm	1"	25 mm	1-3/4"	44 mm	2"	50 mm

**INSUL-TUBE® in thickness noted within the specified temperature ranges will prevent condensation on indoor piping under design conditions defined below. Thickness recommendations above 1-1/2" can be sleeved to achieve thickness desired.*

***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).*

PIPE "R" VALUES PER SQUARE FOOT

PIPE O.D. OR NOMINAL INSULATION I.D.		"R" VALUE 3/8" (10 MM) WALL	"R" VALUE 1/2" (13 MM) WALL	"R" VALUE 3/4" (19 MM) WALL	"R" VALUE 1" (25 MM) WALL	"R" VALUE 1-1/4" (32 MM) WALL	"R" VALUE 1-1/2" (38 MM) WALL	"R" VALUE 2" (50 MM) WALL
3/8"	10 mm	2.7	3.6	5.6	——	——	——	——
1/2"	13 mm	2.5	3.4	5.4	——	——	——	——
5/8"	16 mm	2.5	3.3	5.4	7.5	10.5	12.8	17.8
3/4"	19 mm	2.3	3.1	5.4	7.5	9.9	12.1	16.8
7/8"	22 mm	2.3	3.2	5.4	7.2	9.5	11.6	16.1
1-1/8"	29 mm	2.3	3.1	5.5	7.1	8.9	10.8	15.8
1-3/8"	35 mm	2.2	3.2	5.3	7.3	8.4	10.2	14.9
1-5/8"	41 mm	2.4	3.1	5.1	7.1	8.1	9.8	14.6
1-1/2" IPS	48 mm	2.3	3.0	4.9	6.7	7.7	9.3	13.8
2-1/8"	54 mm	2.3	3.0	4.9	6.8	7.6	9.2	13.6
2" IPS	60 mm	2.3	2.9	4.8	6.5	7.4	9.0	13.3
2-1/2" IPS	64 mm	2.3	3.0	4.6	6.3	7.2	8.6	12.6
2-5/8"	67 mm	2.3	3.1	4.7	6.4	7.3	8.8	12.9
3-1/8"	79 mm	2.3	3.0	4.6	6.2	7.1	8.5	12.4
3" IPS	89 mm	2.3	3.2	4.6	6.1	7.0	8.3	12.2
3-5/8"	92 mm	2.3	3.2	4.6	6.1	6.9	8.3	12.1
4-1/8"	105 mm	2.3	3.1	4.6	6.0	6.8	8.1	11.7
4" IPS	114 mm	2.3	3.2	4.7	6.0	6.8	8.1	11.6
5" IPS	140 mm	——	3.2	4.5	5.9	6.6	7.8	11.1
6" IPS	168 mm	——	3.1	4.5	5.8	6.5	7.6	10.9
8" IPS	219 mm	——	3.1	4.4	——	——	——	——

Note: "R" factors were calculated using a K factor of 0.245 (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.

SPECIFICATION COMPLIANCE

- ASTM C 534 Type 1 (Tubing), Grade 1
- ASTM D 1056-00-2B1
- New York City MEA 186-86-M Vol. V
- USDA Compliant
- RoHS Compliant
- 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-M88
- FMRC Approval Guide Chapter 14 Pipe Insulation
- NFPA No. 101 Class A Rating
- Meets requirements of NFPA 90A Sect. 2.3.3 for Supplementary Materials for Air Distribution Systems
- Meets requirements of ASTM C 411 (Test Method for Hot Surface Performance of High Temperature Thermal Insulation)
- Meets requirements of UL 181 sections 11.0 and 16.0 (Mold Growth/Air Erosion)
- MIL-P-15280, For T (Tubing)
- Meets residential and non-residential requirements for California Energy Commission Building Energy Efficient Standards Title 24
- GREENGUARD® certified under "Children & Schools" and "Indoor Air Quality classifications
- Meets energy code requirements of ASHRAE 90.1 and 189.1

INSUL-TUBE® WHITE TECHNICAL INFORMATION

UL 94 (Recognition No. E300774)

UV resistant Refer to K-Flex USA L.L.C. Technical Bulletin (Outdoor Applications) for More Information

FM APPROVED

Made in USA

Contains a Protective Antimicrobial Agent

GREENGUARD Children & Schools Indoor Air Quality Certified

WHITE ELASTOMERIC INSULATION

INSUL-TUBE® WHITE is designed for use where piping will be painted or left exposed. INSUL-TUBE® WHITE is ideal for supermarket, hospital and school applications where a more hygienic appearance is preferred. INSUL-TUBE® WHITE meets all INSUL-TUBE® specifications and physical properties.

DESCRIPTION

INSUL-TUBE® WHITE pipe insulation is an environmentally friendly, CFC-free, flexible elastomeric thermal insulation. It is white in color and is available in unslit tubular form in wall thicknesses up to 2" in sizes ranging from 3/8" I.D. to 4 1/8" I.D. INSUL-TUBE® WHITE key physical properties are approved through supervision by *Factory Mutual Research Corporation.*

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

APPLICATIONS

INSUL-TUBE® WHITE is used to retard heat gain and prevent condensation or frost formation on refrigerant lines, cold water plumbing and chilled water systems. It also retards heat flow for hot water plumbing, liquid heating, dual temperature piping and many solar systems. INSUL-TUBE® WHITE is designed for the HVAC and Refrigeration market. INSUL-TUBE® WHITE is recommended for applications ranging from -70°F to 220°F (-57°C to 104°C). The expanded closed cell structure makes IINSUL-TUBE® WHITE an efficient insulator and provides effective moisture vapor resistance.

INSUL-TUBE® WHITE has a tough skin that withstands tearing, rough handling and severe environmental conditions, yet is flexible for easy installation. It can be covered easily with a white coating.

INSTALLATION

With a factory-applied coating of talc on the smooth inner surface, INSUL-TUBE® WHITE slides easily over pipe or tubing for quick installation. When applied to existing lines, tubing is slit lengthwise and fitted into place. All seams and butt joints should be sealed with an approved contact adhesive, making sure both surfaces to be joined are coated with adhesive. K-Fit® factory fabricated fittings are also available. ASTM C1710, *Installation Guide for Flexible Closed Cell Foams*, should be used as an installation guide.

INSUL-TUBE® WHITE is intended for indoor use. If used outdoors, K-FLEX® 374 Protective Coating, jacketing or K-FLEX Clad® WT is required to protect it from UV and mechanical abuse.

RESISTANCE TO MOISTURE VAPOR FLOW

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

FLAME AND SMOKE RATING

IINSUL-TUBE® WHITE in wall 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-TUBE® WHITE 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.

PYHSICAL PROPERTIES		INSUL-TUBE® WHITE	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	0.27 (.039) 0.25 (0.036)	ASTM C 177/C 518 ASTM C 177/C 518
Density		3-6 PCF	ASTM D 1622/D 3575
Operating Temperature Range Flexible to -40°F (-40°C)	Upper Lower	220°F (104°C) -70°F (-57°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" wall)		Not greater than 25	ASTM E 84
Smoke Developed (up to 2" wall)		Not greater than 50	ASTM E 84
Ozone Resistance		Pass	ASTM D 1171
Chemical/Solvent Resistance		Good	
Mildew Resistance/Air Erosion		Pass	UL 181

THICKNESS RECOMMENDATIONS* - TO CONTROL CONDENSATION								
	LINE TEMP		LINE TEMP		LINE TEMP		LINE TEMP	
PIPE SIZE	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.)								
3/8" I.D. thru 1-3/8" I.D.	3/8"	10 mm	1/2"	13 mm	3/4"	19 mm	1"	25 mm
Over 1-3/8" thru 3" IPS	3/8"	10 mm	1/2"	13 mm	1"	25 mm	1"	25 mm
Over 3" IPS thru 4" IPS	1/2"	13 mm	1/2"	13 mm	1"	25 mm	1-1/2"	38 mm
Over 4" IPS	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.)								
3/8" I.D. thru 2-1/8" I.D.	3/8"	10 mm	3/8"	10 mm	1/2"	13 mm	1/2"	13 mm
Over 2-1/8" thru 3" IPS	3/8"	10 mm	3/8"	10 mm	1/2"	13 mm	3/4"	19 mm
Over 3" IPS thru 4" IPS	1/2"	13 mm	1/2"	13 mm	3/4"	19 mm	3/4"	19 mm
Over 4" IPS	1/2"	13 mm	1/2"	13 mm	3/4"	19 mm	3/4"	19 mm
Severe Conditions (Max 90°F, 32°C - 80% RH)								
3/8" I.D. thru 1-1/8" I.D.	3/4"	19 mm	3/4"	19 mm	1-1/2"	38 mm	1-1/2"	38 mm
Over 1-1/8" I.D. thru 4" IPS	3/4"	19 mm	1"	25 mm	1-1/2"	38 mm	1-1/2"	38 mm
Over 4" IPS	3/4"	19 mm	1"	25 mm	1-3/4"	44 mm	2"	50 mm

**INSUL-TUBE® WHITE in thickness noted within the specified temperature ranges will prevent condensation on indoor piping under design conditions defined below. Thickness recommendations above 2" can be sleeved to achieve thickness desired.*

***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 high humidity, additional thickness of insulation may be required.*

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

PIPE "R" VALUES PER SQUARE FOOT

PIPE O.D. OR NOMINAL INSULATION I.D.		"R" VALUE 1/2" (13 MM) WALL	"R" VALUE 3/4" (19 MM) WALL	"R" VALUE 1" (25 MM) WALL	"R" VALUE 1-1/2" (38 MM) WALL	"R" VALUE 2" (50 MM) WALL
3/8"	10 mm	3.5	5.5	——	——	——
1/2"	13 mm	3.3	5.2	——	——	——
5/8"	16 mm	3.2	5.3	7.4	12.5	17.5
3/4"	19 mm	3.0	5.3	7.3	11.8	16.5
7/8"	22 mm	3.1	5.3	7.0	11.3	15.8
1-1/8"	29 mm	3.1	5.5	7.1	10.8	15.5
1-3/8"	35 mm	3.1	5.2	7.2	10.0	14.6
1-5/8"	41 mm	3.1	5.2	7.1	9.8	14.4
1-1/2" IPS	48 mm	3.0	5.0	6.7	9.3	13.6
2-1/8"	54 mm	3.2	5.0	6.8	9.3	13.4
2" IPS	60 mm	3.1	4.9	6.6	9.1	13.0
2-1/2" IPS	64 mm	3.2	4.8	6.4	8.7	12.4
2-5/8"	67 mm	3.2	4.8	6.5	8.8	12.7
3-1/8"	79 mm	3.1	4.6	6.2	8.4	12.2
3" IPS	89 mm	3.3	4.7	6.2	8.4	11.9
3-5/8"	92 mm	3.2	4.6	6.0	8.2	11.8
4-1/8"	105 mm	3.1	4.6	5.9	8.0	11.5
4" IPS	114 mm	3.2	4.6	5.9	7.9	11.4
5" IPS	140 mm	3.0	4.3	5.6	7.5	10.9
6" IPS	168 mm	3.1	4.4	5.7	7.5	10.6
8" IPS	219 mm	3.0	4.3	——	——	——

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.*

SPECIFICATION COMPLIANCE

- ASTM C 534 Type 1 (Tubing), Grade 1
- ASTM D 1056-00-2B1
- New York City MEA 186-86-M Vol. V
- USDA Compliant
- RoHS Compliant
- ASTM E 84 2" 25/50-tested according to UL 723 and NFPA 255
- Complies with requirements of CAN/ULC S102-M88
- FMRC Approval Guide Chapter 14 Pipe Insulation
- NFPA No. 101 Class A Rating
- Meets requirements of NFPA 90A Sect. 2.3.3 for Supplementary Materials for Air Distribution Systems
- GREENGUARD® certified under "Children & Schools" and "Indoor Air Quality" classifications

INSUL-LOCK® TECHNICAL INFORMATION

UL 94 (Recognition No. E300774)

UV resistant Refer to K-Flex USA L.L.C. Technical Bulletin (Outdoor Applications) for More Information

FM APPROVED

Made in USA

Contains a Protective Antimicrobial Agent

Children & Schools GREENGUARD Indoor Air Quality Certified

DESCRIPTION

INSUL-LOCK® is environmentally friendly, CFC-free, flexible elastomeric thermal insulation. It is pre-slit with a factory-applied pressure sensitive adhesive on both seam surfaces. It is black in color and is available up to 1" wall thickness and 4" IPS. INSUL-LOCK® key physical properties are approved through supervision by *Factory Mutual Research Corporation*.

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

APPLICATIONS

INSUL-LOCK® is used to retard heat flow and prevent condensation on refrigerant lines, cold water plumbing, roof drains and chilled water systems. INSUL-LOCK® is recommended for applications ranging from -70°F to 200°F (-57°C to 93°C) for both new and existing applications and can be used with heat tracing/heat tapes. For best results, store and install INSUL-LOCK® at temperatures above 40°F (4°C).

INSTALLATION

INSUL-LOCK® is designed for quick and easy installation: slip on the tube, pull built-in release liners, pinch tube shut and apply pressure at the seams. The seam should be positioned on the bottom of the pipe. *See technical bulletin for installation instructions in cold temperatures.*

All butt joints must be sealed with an approved contact adhesive. Fittings are fabricated from miter-cut tubular sections of INSUL-TUBE®, and covers, flanges, etc from INSUL-SHEET®. K-FIT® factory-fabricated fittings are also available. INSUL-LOCK®'s closure system is designed to save on labor costs, particularly on straight runs. It greatly reduces the use of contact adhesives, allowing for improved working conditions and compliance with OSHA requirements.

OUTDOOR APPLICATIONS

INSUL-LOCK® is made from a UV-resistant elastomeric blend. However, when subject to severe UV exposure (rooftop applications) or where optimum performance is required, K-FLEX® 374 Protective Coating, approved jacketing or K-FLEX Clad® AL or WT should be used. Similar to indoor applications, the seam should be positioned on the bottom of the pipe.

FEATURES & BENEFITS

- Faster installation
- Easier handling (3-foot lengths)
- Ideal for straight runs
- Less use of contact adhesives

RESISTANCE TO MOISTURE VAPOR FLOW

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

FLAME AND SMOKE RATING

INSUL-LOCK® in thicknesses up to 1" (25 mm) 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-LOCK® 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.

PYHSICAL PROPERTIES		INSUL-LOCK®	TEST METHODS
Thermal Conductivity (K) BTU - in/hr - Ft^2 - °F (W/mK)	75°F (24°C) Mean Temp	0.245 (0.0353)	ASTM C 177/C 518
Density		3-6 PCF	ASTM D 1622/ ASTM D 3575
Operating Temperature Range	Upper Lower	200°F (93°C) -70°F (-57°C)	
Water Vapor Permeability Dry Cup. Perm-In		0.03	ASTM E 96
Water Absorption %		<0.20 by volume	ASTM C 209
Flame Spread (up to 1-1/2" wall)		Not greater than 25	ASTM E 84
Smoke Developed (up to 1-1/2" wall)		Not greater than 50	ASTM E 84
Ozone Resistance		Good	ASTM D 1171
Chemical/Solvent Resistance		Good	
Mildew Resistance/Air Erosion		Pass	UL 181
UV Weather Resistance		Pass	QUV Chamber Test
Color		Black	
Resistance to oil & greases		Good	
Odor		Negligible	
% closed cells		>90	
Dimensional Stability		<4.0 at 220°F (104°C)	ASTM C 534
Flexibility		Excellent	

THICKNESS RECOMMENDATIONS* - TO CONTROL CONDENSATION

	LINE TEMP		LINE TEMP		LINE TEMP		LINE TEMP	
PIPE SIZE	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.)								
3/8" I.D. thru 1-3/8" I.D.	3/8"	10 mm	1/2"	13 mm	3/4"	19 mm	1"	25 mm
Over 1-3/8" thru 3" IPS	3/8"	10 mm	1/2"	13 mm	1"	25 mm	1"	25 mm
Over 3" IPS thru 4" IPS	1/2"	13 mm	1/2"	13 mm	1"	25 mm	1-1/4"	32 mm
Over 4" IPS	1/2"	13 mm	3/4"	19 mm	1"	25 mm	1-1/4"	32 mm
Mild Conditions (Max 80°F, 26°C - 50% R.H.)								
3/8" I.D. thru 2-1/8" I.D.	3/8"	10 mm	3/8"	10 mm	1/2"	13 mm	1/2"	13 mm
Over 2-1/8" thru 3" IPS	3/8"	10 mm	3/8"	10 mm	1/2"	13 mm	3/4"	19 mm
Over 3" IPS thru 4" IPS	1/2"	13 mm	1/2"	13 mm	3/4"	19 mm	3/4"	19 mm
Over 4" IPS	1/2"	13 mm	1/2"	13 mm	3/4"	19 mm	3/4"	19 mm
Severe Conditions (Max 90°F, 32°C - 80% RH)								
3/8" I.D. thru 1-1/8" I.D.	3/4"	19 mm	3/4"	19 mm	1-1/4"	32 mm	1-1/4"	32 mm
Over 1-1/8" I.D. thru 4" IPS	3/4"	19 mm	1"	25 mm	1-1/2"	38 mm	1-1/2"	38 mm

**INSUL-LOCK® in thickness noted within the specified temperature ranges will prevent condensation on indoor piping under design conditions defined below. Thickness recommendations above 1" can be sleeved to achieve thickness desired.*

***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).*

INSUL-LOCK® "R" VALUES

PIPE O.D. OR NOMINAL INSULATION I.D.		"R" VALUE 3/8" (10 MM) WALL	"R" VALUE 1/2" (13 MM) WALL	"R" VALUE 3/4" (19 MM) WALL	"R" VALUE 1" (25 MM) WALL
3/8"	10 mm	2.7	3.6	5.6	——
1/2"	13 mm	2.5	3.4	5.4	——
5/8"	16 mm	2.5	3.3	5.4	7.5
3/4"	19 mm	2.3	3.1	5.4	7.5
7/8"	22 mm	2.3	3.2	5.4	7.2
1-1/8"	29 mm	2.3	3.1	5.5	7.1
1-3/8"	35 mm	2.2	3.2	5.3	7.3
1-5/8"	41 mm	2.4	3.1	5.1	7.1
1-1/2" IPS	48 mm	2.3	3.0	4.9	6.7
2-1/8"	54 mm	2.3	3.0	4.9	6.8
2" IPS	60 mm	2.3	2.9	4.8	6.5
2-1/2" IPS	64 mm	2.3	3.0	4.6	6.3
2-5/8"	67 mm	2.3	3.1	4.7	6.4
3-1/8"	79 mm	2.3	3.0	4.6	6.2
3" IPS	89 mm	2.3	3.2	4.6	6.1
3-5/8"	92 mm	2.3	3.2	4.6	6.1
4-1/8"	105 mm	2.3	3.1	4.6	6.0
4" IPS	114 mm	2.3	3.2	4.7	6.0

Note:*"R" factors were calculated using a K factor of 0.245 (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.*

SPECIFICATION COMPLIANCE

- ASTM C 534 Type 1 (Tubing), Grade 1
- ASTM D 1056-00-2B1
- New York City MEA 186-86-M Vol. V
- USDA Compliant
- RoHS Compliant
- UL 94-5V Flammability Classification (Recognition No. E300774)
- ASTM E 84 1" 25/50-tested according to UL 723 and NFPA 255
- Complies with requirements of CAN/ULC S102-03
  FMRC Approval Guide Chapter 14 Pipe Insulation
- Meets requirements of NFPA 90A Sect. 2.3.3 for Supplementary Materials for Air Distribution Systems
- Meets requirements of ASTM C 411 (Test Method for Hot Surface Performance of High Temperature Thermal Insulation)
- Meets requirements of UL 181 sections 11.0 and 16.0 (Mold Growth/Air Erosion)
- Meets residential and non-residential requirements for California Energy Commission Building Energy Efficient Standards Title 24
- GREENGUARD certified under "Children & Schools" and "Indoor Air Quality" classifications
- Meets energy code requirements of ASHRAE 90.1 and 189.1

INSUL-LOCK® WHITE TECHNICAL INFORMATION

UL 94 (Recognition No. E300774)

UV resistant Refer to K-Flex USA L.L.C. Technical Bulletin (Outdoor Applications) for More Information

FM APPROVED

Made in USA

Contains a Protective Antimicrobial Agent

GREENGUARD Children & Schools Indoor Air Quality Certified

DESCRIPTION

INSUL-LOCK® White is environmentally friendly, CFC-free, flexible elastomeric thermal insulation. It is pre-slit with a factory-applied pressure sensitive adhesive applied to both seam surfaces. It is white in color, designed for use where piping will be painted or left exposed, and is available in 1/2" and 1" wall thickness and in sizes ranging from 1/2" to 3-1/8" ID. INSUL-LOCK® White key physical properties are approved through supervision by *Factory Mutual Research Corporation*.

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

APPLICATIONS

INSUL-LOCK® White is used to retard heat flow and prevent condensation for hot/cold water plumbing lines. INSUL-LOCK® White is recommended for applications ranging from -70°F to 200°F (-57°C to 93°C) for both new and existing applications and can be used with heat tracing/heat tapes. For best results, store and install INSUL-LOCK® White at temperatures above 40°F (4°C).

INSTALLATION

INSUL-LOCK® White is designed for quick and easy installation: slip on the tube, pull built-in release liners, pinch tube shut and apply pressure at the seams. The seam should be positioned on be on the bottom of the pipe.

For best results, peel release liner from both ends, working towards the center to ensure even seams at the butt joints. For hot applications (45°F and above), butt seams can be sealed with an approved contact adhesive or tape (non-condensation applications). Fittings are fabricated from miter-cut tubular sections of INSUL-LOCK® White. K-Fit® factory fabricated fittings are also available.

INSUL-LOCK® White's closure system is designed to save labor costs, particularly on straight runs and retrofit applications. It greatly reduces the use of contact adhesives, allowing for improved working conditions and compliance with OSHA requirements.

FEATURES & BENEFITS

- Faster installation
- Easier handling (3-foot lengths)
- Ideal for straight runs
- Less use of contact adhesives

These advantages are particularly evident when working from ladders, lifts or scaffolding.

RESISTANCE TO MOISTURE VAPOR FLOW

The closed cell structure and unique formulation of INSUL-LOCK® White effectively retards the flow of moisture vapor, and is considered a low transmittance vapor retarder.

FLAME AND SMOKE RATING

INSUL-LOCK® White pipe insulation in 1" (25 mm) wall thickness 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-LOCK® White 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.

PYHSICAL PROPERTIES		INSUL-LOCK® WHITE	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	0.27 (0.039) 0.25 (0.036)	ASTM C 177/C 518 ASTM C 177/C 518
Density		3-6 PCF	ASTM D 1622/ ASTM D 3575
Operating Temperature Range	Upper Lower	200°F (93°C) -70°F (-57°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" wall)		Not greater than 25	ASTM E 84
Smoke Developed (up to 1-1/2" wall)		Not greater than 50	ASTM E 84
Ozone Resistance		Pass	ASTM D 1171
Chemical/Solvent Resistance		Good	
Mildew Resistance/Air Erosion		Pass	UL 181

THICKNESS RECOMMENDATIONS* - TO CONTROL CONDENSATION		
	LINE TEMP	
PIPE SIZE	45°F	7°C
Normal Conditions (Max 85°F, 29°C - 70% R.H.)		
3/8" thru 1-3/8" I.D.	1/2"	12 mm
Over 1-3/8" thru 3-1/8" ID	1/2	12 mm
Mild Conditions (Max 80°F, 26°C - 50% R.H.)		
3/8" thru 2-1/8" I.D.	1/2"	12 mm
Over 2-1/8" thru 3-1/8" ID	1/2"	12 mm
Severe Conditions (Max 90°F, 32°C - 80% RH)		
3/8" thru 1-1/8" I.D.	1"	25 mm
Over 1-1/8" thru 2-5/8" ID**	1"	25 mm

**INSUL-LOCK® WHITE 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.*

*** For severe conditions use INSUL-LOCK® or INSUL-TUBE® White 1" wall thickness.*

INSUL-LOCK® WHITE "R" VALUES

PIPE O.D. OR NOMINAL INSULATION I.D.		"R" VALUE 1/2" (13 MM) WALL	"R" VALUE 1" (25 MM) WALL
3/8"	10 mm	3.5	——
1/2"	13 mm	3.3	——
5/8"	16 mm	3.2	7.4
3/4"	19 mm	3.0	7.3
7/8"	22 mm	3.1	7.0
1-1/8"	29 mm	3.1	7.1
1-3/8"	35 mm	3.1	7.2
1-5/8"	41 mm	3.1	7.1
1-1/2" IPS	——	3.0	6.7
2-1/8"	54 mm	3.2	6.8
2" IPS	——	3.1	6.6
2-1/2" IPS	64 mm	3.2	6.4
2-5/8"	67 mm	3.2	6.5
3-1/8"	79 mm	3.1	6.2

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.*

SPECIFICATION COMPLIANCE

- ASTM C 534 Type 1 (Tubing), Grade 1
- ASTM D 1056-00-2B1
- USDA Compliant
- RoHS Compliant
- UL 94-5V Flammability Classification (Recognition No. E300774)
- ASTM E 84 1" 25/50-tested according to UL 723 and NFPA 255
- Complies with requirements of CAN/ULC S102-03
- Acceptable for clean room applications
- Meets requirements of NFPA 90A Sect. 2.3.3 for Supplementary Materials for Air Distribution Systems
- Meets requirements of ASTM C 411 (Test Method for Hot Surface Performance of High Temperature Thermal Insulation)
- Meets requirements of UL 181 sections 11.0 and 16.0 (Mold Growth/Air Erosion)
- GREENGUARD certified under "Children & Schools" and "Indoor Air Quality" classifications

INSUL-TUBE® COIL TECHNICAL INFORMATION

UL 94 (Recognition No. E300774)
UV resistant Refer to K-Flex USA L.L.C. Technical Bulletin (Outdoor Applications) for More Information

FM APPROVED

Made in USA

Contains a Protective Antimicrobial Agent

GREENGUARD Children & Schools Indoor Air Quality Certified

DESCRIPTION

INSUL-TUBE® Coil pipe insulation is environmentally friendly, CFC-free, flexible elastomeric thermal insulation. It is available as continuous length, unslit tubing up to 1" thickness in lengths ranging from 250 ft to 2800 ft depending on ID size and wall thickness. INSUL-TUBE® COIL key physical properties are approved through supervision by *Factory Mutual Research Corporation*.

INSUL-TUBE® COIL is non-porous, fiber-free and resists mold, fungal and bacterial growth. K-FLEX USA elastomeric insulation products are GREENGUARD® certified for low VOC content and meet the requirements of the *"Children and Schools"* classification and *"Microbial Resistant"* listing.

APPLICATIONS

INSUL-TUBE® COIL is used to prevent condensation or frost formation on line sets or extended length copper piping for chilled water or refrigeration systems. It also retards heat flow for hot water plumbing, liquid heating, dual temperature piping, and many solar systems.

INSUL-TUBE® COIL is recommended for applications ranging from -297°F to 220°F (-182°C to 104°C). The expanded closed-cell structure makes INSUL-TUBE® COIL an efficient insulator and provides effective moisture vapor resistance. INSUL-TUBE® COIL can be used with heat tracing/heat tapes.

INSUL-TUBE® COIL is tough enough to withstand tearing, rough handling, and severe environmental conditions, but has superior flexibility for easy installation, including in cold weather.

INSTALLATION

INSUL-TUBE® Coils are best applied to straight runs free of corners and bends. Offered with or without a factory-applied coating of talc on the inner surface for effortless sliding, INSUL-TUBE® COIL slides easily over pipe or tubing for quick installation. All butt joints should be sealed with K-FLEX® Contact Adhesive, making sure both surfaces to be joined are coated with adhesive.

OUTDOOR APPLICATIONS

INSUL-TUBE® COIL Pipe Insulation is made from a UV-resistant elastomeric blend. For severe UV exposure (rooftop applications), K-FLEX® 374 Protective Coating or approved jacketing should be used.

UNDERGROUND

For buried lines above the water table, use a clean fill such as sand (3"-5" layer) to protect INSUL-TUBE® COIL before backfilling. It is recommended that materials to be buried are properly sealed at all seams and butt joints with an approved contact adhesive. For optimum performance, the lines should be encased in a conduit to protect them from problems associated with ground water and compaction.

RESISTANCE TO MOISTURE VAPOR FLOW

The closed-cell structure and unique formulation of INSUL-TUBE® COIL effectively retards the flow of moisture vapor, and is considered a low transmittance vapor retarder. For most indoor applications, INSUL-TUBE® COIL needs no additional protection.

Additional vapor barrier protection may be necessary for INSUL-TUBE® COIL when installed on low temperature surfaces that are exposed to continuous high humidity.

FLAME AND SMOKE RATING

INSUL-TUBE® COIL pipe insulation in wall thicknesses of 1" (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 Method of Testing entitled: *"Surface Burning Characteristics of Building Materials"*. INSUL-TUBE® COIL is acceptable for 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 us in the selection of products to meet limits specified, when compared to a known standard.

SPECIFICATION COMPLIANCE

- ASTM C 534 Type 1 (Tubing), Grade 1
- ASTM D 1056-00-2B1
- New York City MEA 186-86-M Vol. V
- UL 94-5V Flammability Classification Recognition No. E300774)
- ASTM E 84 1" 25/50-tested according to UL 723 and NFPA 255
- Complies with requirements of CAN/ULC S102-03
- FMRC Approval Guide Chapter 14 Pipe Insulation
- NFPA No. 101 Class A Rating
- Meets requirements of NFPA 90A Sect. 2.3.3 for Supplementary Materials for Air Distribution Systems
- Meets requirements of ASTM C 411 (Test Method for Hot Surface Performance of High Temperature Thermal Insulation)
- Meets requirements of UL 181 sections 11.0 and 16.0 (Mold Growth/Air Erosion)
- MIL-P-15280, For T (Tubing)

PYHSICAL PROPERTIES		INSUL-TUBE® COIL	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/C 518 ASTM C 177/C 518
Density		3-6 PCF	ASTM D 1622/ ASTM D 3575
Operating Temperature Range Flexible to -40°F (-40°C)	Upper Lower	220°F (104°C) -297°F (-182°C)	
Water Vapor Permeability Dry Cup. Perm-In		0.03	ASTM E 96
Water Absorption %		<0.20 by volume	ASTM C 209
Flame Spread (up to 1" wall)		Not greater than 25	ASTM E 84
Smoke Developed (up to 1" wall)		Not greater than 50	ASTM E 84
Ozone Resistance		Pass	ASTM D 1171
Chemical/Solvent Resistance		Good	
Mildew Resistance/Air Erosion		Pass	UL 181
UV Weather Resistance		Pass	QUV Chamber Test

THICKNESS RECOMMENDATIONS* - TO CONTROL CONDENSATION

	LINE TEMP		LINE TEMP		LINE TEMP		LINE TEMP	
PIPE SIZE	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.)								
3/8" I.D. thru 1-3/8" I.D.	3/8"	10 mm	1/2"	13 mm	3/4"	19 mm	1"	25 mm
Over 1-3/8" thru 3" IPS	3/8"	10 mm	1/2"	13 mm	1"	25 mm	1"	25 mm
Mild Conditions (Max 80°F, 26°C - 50% R.H.)								
3/8" I.D. thru 2-1/8" I.D.	3/8"	10 mm	3/8"	10 mm	1/2"	13 mm	1/2"	13 mm
Over 2-1/8" thru 3" IPS	3/8"	10 mm	3/8"	10 mm	1/2"	13 mm	3/4"	19 mm

INSUL-TUBE® COIL 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. Under conditions of higher humidity, additional thickness of insulation may be required.* ***NOTE:*** *Thickness recommendations calculated using 0.2575 K-factor (0.245 plus 5% test error allowance)*

INSUL-TUBE® COIL "R" VALUES

PIPE O.D. OR NOMINAL INSULATION I.D.		"R" VALUE 3/8" (10 MM) WALL	"R" VALUE 1/2" (13 MM) WALL	"R" VALUE 3/4" (19 MM) WALL	"R" VALUE 1" (25 MM) WALL
3/8"	10 mm	2.7	3.3	5.6	——
1/2"	13 mm	2.5	3.4	5.4	——
5/8"	16 mm	2.5	3.3	5.4	7.5
3/4"	19 mm	2.3	3.1	5.4	7.5
7/8"	22 mm	2.3	3.2	5.4	7.2
1-1/8"	29 mm	2.3	3.1	5.5	7.1
1-3/8"	35 mm	2.2	3.2	5.3	7.3
1-5/8"	41 mm	2.4	3.1	5.1	7.1
1-1/2" IPS	48 mm	2.3	3.0	4.9	6.7
2-1/8"	54 mm	2.3	3.0	4.9	6.8
2" IPS	60 mm	2.3	2.9	4.8	6.5
2-1/2" IPS	64 mm	2.3	3.0	4.6	6.3
2-5/8"	67 mm	2.3	3.1	4.7	6.4
3-1/8"	79 mm	2.3	3.0	4.6	6.2
3" IPS	89 mm	2.3	3.2	4.6	6.1

Note: *"R" factors were calculated using a K factor of 0.245 (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.*

INSUL-SHEET®/ROLL S2S DESIGNED FOR THE HVAC/R INDUSTRY

INSUL-SHEET®

INSUL-SHEET® flexible, fiber-free insulation prevents condensation, frost formation and heat/loss gain to create durable, energy-efficient HVAC systems. Its closed cell structure and tough skin inherently resists mold growth without the need for a jacket to provide these properties.

Temperature Range: -297°F to 220°F (-182°C to 104°C) for piping; -297°F to 200°F (-182°C to 93°C) for full adhesion

Designed for large surface areas (ducts, tanks and large diameter pipes). Reduced number of sections simplifies installation, saving on time and labor costs.

INSUL-SHEET® WITH PSA

INSUL-SHEET® with PSA is flexible, fiber-free elastomeric insulation with a factory-applied pressure-sensitive adhesive liner.

Features of PSA: tear and moisture resistant easy release liner, reinforced scrim prevents stretching and improves peel strength, reduced installation time and use of contact adhesives, and flexible and easy to install at low temperatures.

Temperature range: -70°F to 200°F (-57°C to 93°C)

RANGE

SHEETS 36" X 48"

STANDARD THICKNESS	ADHESIVE THICKNESS:
1/8" to 2"	1/8" to 1-1/2"

INSUL-SHEET®/ROLL S2S TECHNICAL INFORMATION

UL 94 (Recognition No. E300774)

UV resistant Refer to K-Flex USA L.L.C. Technical Bulletin (Outdoor Applications) for More Information

FM APPROVED

Made in USA

Contains a Protective Antimicrobial Agent

GREENGUARD Children & Schools Indoor Air Quality Certified

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 next page for specific recommendations.*

INSTALLATION

When INSUL-SHEET® 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 an easy-to-use release liner. ASTM C1710, *Installation Guide for Flexible Closed Cell Foams*, should be used as an installation guide.

OUTDOOR APPLICATIONS

For optimum performance, outdoor applications require K-FLEX® 374 Protective Coating, approved jacketing or K-FLEX® Clad AL or WT. 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® 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 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.

PYHSICAL PROPERTIES		INSUL-SHEET®/ROLLS S2S	TEST METHODS
Thermal Conductivity (K) BTU - in/hr - Ft^2 - °F (W/mK)	75°F (24°C) Mean Temp	0.245 (0.0353)	ASTM C 177/ ASTM C 518
Density		3-6 PCF	ASTM D 1622/ ASTM D 3575
Operating Temperature Range	Upper Lower	220°F (104°C) -297°F (-182°C)	
Water Vapor Permeability Dry Cup. Perm-In		0.03	ASTM E 96
Water Absorption %		<0.20 by volume	ASTM C 209
Flame Spread (up to 2" wall)		Not greater than 25	ASTM E 84
Smoke Developed (up to 2" wall)		Not greater than 50	ASTM E 84
Ozone Resistance		Good	ASTM D 1171
Chemical/Solvent Resistance		Good	
Mildew Resistance/Air Erosion		Pass	UL 181
Resistance to U.V. & weather		Good[1]	
Color		Black	
Resistance to oil & greases		Good	
Odor		Negligible	
% closed cells		>90	
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

INSUL-SHEET® "R" VALUES

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					

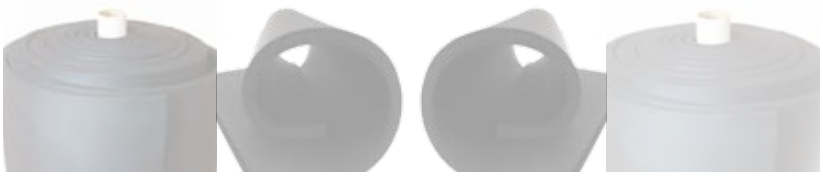
Note: *"R" factors were calculated using a K factor of 0.2575 (0.245 plus 5% test error allowance at 75º F, 24ºC mean temp.) and nominal wall thickness is each case. Lower operating temperatures will result in improved R values. Contact Technical Services for specific recommendations.*

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	1-3/4"	44 mm**	2"	51 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)*



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)
- Meets energy code requirements of ASHRAE 90.1 and 189.1
- 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 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)
- R8 Sheet meets R-value requirments of the International Energy Conservation Code for Outdoor Ductwork
- MIL-P-15280, Form S (Sheet)
- GREENGUARD certified under the "Children & Schools" and "Indoor Air Quality" classifications

INSUL-SHEET®/ROLL WITH PSA TECHNICAL INFORMATION

UL 94 (Recognition No. E300774)
UV resistant Refer to K-Flex USA L.L.C. Technical Bulletin (Outdoor Applications) for More Information

FM APPROVED

Made in USA

Contains a Protective Antimicrobial Agent

GREENGUARD Children & Schools Indoor Air Quality Certified

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") 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 is also available in rolls, with a standard roll width of 48". 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. It also effectively retards heat loss when used on hot or cold equipment or ducts. 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 next page for specific recommendations.*

INSTALLATION

INSUL-SHEET® with PSA is applied to clean, dry ductwork 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.*

INSUL-SHEET® with PSA is also available with factory-applied cladding for indoor and outdoor applications. Contact K-FLEX USA for specific installation instructions. ***INSUL-SHEET® with PSA is acceptable for use in duct covering applications. K-FLEX Duct® Liner Gray should be used for duct lining applications.***

OUTDOOR APPLICATIONS

For optimum performance, outdoor applications require K-FLEX® 374 Protective Coating, approved jacketing, or K-FLEX Clad® AL or WT. For more detailed information, refer to the *Installation Guidelines*.

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 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, "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.

PYHSICAL PROPERTIES		INSUL-SHEET® / ROLL WITH PSA	TEST METHODS
Thermal Conductivity (K) BTU - in/hr - Ft^2 - °F (W/mK)	75°F (24°C) Mean Temp	0.245 (0.0353)	ASTM C 177/ ASTM C 518
Density		3-6 PCF	ASTM D 1622/ ASTM D 3575
Operating Temperature Range	Upper Lower	200°F (93°C) -70°F (-57°C)	
Water Vapor Permeability Dry Cup. Perm-In		0.03	ASTM E 96
Water Absorption %		<0.20 by volume	ASTM C 209
Flame Spread (up to 1-1/2" wall)		Not greater than 25	ASTM E 84
Smoke Developed (up to 1-1/2" wall)		Not greater than 50	ASTM E 84
Ozone Resistance		Good	ASTM D 1171
Chemical/Solvent Resistance		Good	
Mildew Resistance/Air Erosion		Pass	UL 181
Resistance to U.V. & weather		Good[1]	
Color		Black	
Resistance to oil & greases		Good	
Odor		Negligible	
% closed cells		>90	
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

INSUL-SHEET® "R" VALUES					
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 (0.245 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.*

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	1-3/4"	44 mm**	2"	51 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)*

PRESSURE SENSITIVE ADHESIVE PROPERTIES (PSA)

Description:	Transfer tape designed for high temperatures (250°F), high performance applications where high tack, comformability, plasticizer resistance and a thin bond layer are required.
Construction:	Adhesive: High coat weight modified crosslinked acrylic typified by a high initial tack, plasticizer resistance and high shear strength, resistant to solvents, chemicals, UV light and moisture.
Scrim:	Support (6 g/m^2).
Liner:	PE release liner, (75 microns) moisutre and tear resistant, easy release.

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 per ASTM E 90
- NRC = .35 at 1" per ASTM C423 CAN/ULC S102-03
- UL 94-5V Flammability Classification (Recognition No. E300774) Foam Core: ASTM E 84 25/50 at 1-1/2" and below; PSA: 0/10
- Meets requirements of NFPA 90A 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)
- GREENGUARD certified under the "Children & Schools" and "Indoor Air Quality" classifications
- Meets energy code requirements of ASHRAE 90.1 and 189.1

K-FLEX ACCESSORIES

complete range of complementary products

K-FLEX® ACCESSORIES

BENEFITS:

- Reliable performance
- Full system offering
- Convenient and easy to use

K-FLEX USA OFFERS A FULL RANGE OF ACCESSORIES to complement its insulation offerings. This includes insulated pipe supports, protective coating, contact adhesives and insulation tapes.

K-FLEX® ELASTOMERIC FOAM TAPE TECHNICAL INFORMATION

Contains a Protective Antimicrobial Agent

Made in USA

DESCRIPTION

K-FLEX® Elastomeric Foam Tape is a convenient and easy-to-use product that complements the K-FLEX USA family of tubing and sheet insulation products. It is a specially designed flexible, elastomeric insulation product. It is manufactured in 1/8" thickness by 2" width by 30' length, with pressure sensitive adhesive for applying to hot or cold pipes and fittings. The factory-applied pressure sensitive acrylic adhesive adheres firmly and forms a long-lasting bond, while the closed cell structure of the product provides good thermal and low moisture permeability properties.

USES

K-FLEX® Elastomeric Foam Tape is used to retard heat gain and prevent condensation or frost formation on cold water plumbing, chilled water, and refrigeration lines. It also reduces heat flow for hot water plumbing, liquid heating, and dual temperature piping. K-FLEX® Elastomeric Foam Tape is ideal for insulating short runs of pipes or valves and fittings where it is impractical to install tubing insulation. The tape can be applied in multiple wraps (thickness) to meet various service conditions.

APPLICATION INSTRUCTIONS

K-FLEX® Elastomeric Foam Tape may be applied to all diameter pipes and tubes by spiral winding. Remove the release paper as the tape is spiral-wrapped around the pipe. Avoid stretching. Edges may be butted or overlapped. The seams are sealed with slight hand pressure. Surfaces to which K-FLEX® Elastomeric Foam Tape is to be applied must be dry and clean. For best results, apply at temperature above 40˚F (4˚C) and not on heated surfaces.

SPECIFICATIONS

K-FLEX® Elastomeric Foam Tape is manufactured using K-FLEX USA elastomeric sheet insulation and meets the same physical property specifications.

PHYSICAL PROPERTIES	
Skin Surface	Smooth, black surface for excellent appearance
Composition	Flexible, closed cell elastomeric insulation
Color	Black
Dimensions	1/8" (3 mm) x 2" (50 mm) x 30' (9.1 m) roll 12 rolls per master carton
Density	4-8 lb/cu. ft.
Thermal Conductivity	0.245 at 75°F, tested according to ASTM C-177
Water Absorption	0.10 lbs./cut surface area, ASTM 1667
Water Vapor Permeability	0.10 perms-in (dry cup) ASTM E96
Flammability Characteristics	ASTM E 84 25/50 Rated
Temperature Limits	-40°F (-40°C) to 200°F (93°C)
Freight Classification	Tape, insulation, NOIBN. No label required

THICKNESS RECOMMENDATIONS - TO CONTROL CONDENSATION		
Air Temperature and Relative Humidity	**Pipe Temp**	
	50°F (10°C)	32°F (0°C)
77°F (25°C)/50% RH	Single Layer	2 Layers
85°F (29°C)/70% RH	3 Layers	4 Layers

NOTE: *Thickness recommendations calculated using 0.2575 K-factor (0.245 plus 5% test error allowance)*

K-FLEX® CORK INSULATION TAPE TECHNICAL INFORMATION

Made in USA

DESCRIPTION

K-FLEX® Cork Insulation Tape is a convenient and easy-to-use product that complements the K-FLEX USA family of tubing and sheet insulation products. Specifically, it is a cork-filled rubber-based mastic used as a barrier to prevent water condensation on cold water pipes and copper tubing.

USES

This product was formulated to provide insulation and to prevent condensation on pipes, fittings and tubing used in heating, air conditioning, refrigeration and plumbing applications. K-FLEX® Cork Insulation Tape is ideal for insulating short runs of pipes or valves and fittings where it is impractical to install tubing insulation. The tape can be applied in multiple wraps (thickness) to meet various service conditions.

APPLICATION INSTRUCTIONS

This product adheres well to most clean, dry surfaces, making it possible to apply more than one layer without adding fasteners or adhesives. It is sufficiently soft and pliable to be molded around most fittings and connections and retains its flexibility and adhesion over a surface temperature range of -20˚F to 150˚F (-29˚C to 66˚C). It is black in color and has a grainy rubber-like consistency. It has a very slight odor. K-FLEX® Cork Insulation Tape may be applied to all diameter pipes and tubes by spiral winding. Remove the release paper as the tape is spiral-wrapped around the pipe. Edges may be butted or overlapped. The seams are sealed with slight hand pressure. Surfaces to which K-FLEX® Cork Insulation Tape is to be applied must be dry and clean.

PHYSICAL PROPERTIES	K-FLEX® CORK INSULATION TAPE	TEST METHODS
Color	Black	ASTM D1720-69
Solids Content	99.8%	ASTM C771-74
Thermal Conductivity (k-Factor)	1.26 BTU/(sq.ft.)(hr.)(˚F/in.)	ASTM C177
Moisture Vapor Transmission	0.021 perm-in	ASTM E90
Water Absorption	0.02%	ASTM E1056
Ozone Resistance	Excellent	
High Temperature Limit	150˚F (66˚C)	
Elongation	50% min.	Q'SO test method
Direct Tension Adhesion	6.2 N/cm^2 (9.0 lbs./in.^{2}) min.	Q'SO test method
Peel off Force	30 N (6.75 lbs.) min.	Q'SO test method
Specific Gravity	0.75± 0.05	ASTM D71-72

K-FLEX® 374 PROTECTIVE COATING TECHNICAL INFORMATION

Made in USA

DESCRIPTIONS

K-FLEX® 374 Protective Coating is a water-based coating specifically recommended for weather protection on K-FLEX USA closed-cell tubing and sheet insulations when used in outdoor applications. K-FLEX® 374 provides a flexible, satin finish that is decorative as well as protective. It is ideal for both indoor and outdoor applications. It is supplied in gallon containers, 4 containers to a case.

APPLICATIONS

This product is designed for industrial use only and should be applied only by trained and qualified craftspeople. The surfaces to be coated should be wiped until thoroughly oil-free, clean and dry. K-FLEX® 374 may be applied with a brush, short-nap roller or sprayed. For best results, a two-coat application is recommended. Apply between 40° F and 110° F. Allow the first coat to dry a minimum of 30 minutes before applying the second coat. Do not over brush. Seams freshly joined with K-FLEX contact adhesives are not affected by coating of K-FLEX® 374. Food stored in area should be removed during application to avoid odor pick-up. Do not thin. Stir well. Close container after each use. Use fresh, clean water for clean up.

INDOOR APPLICATION

K-FLEX® 374 Protective Coating offers a tough, cleanable surface for indoor applications. The decorative coating can be tinted with common pigment pastes used for tinting latex paint. (Pigments should be added at the rate of less than 4.3 oz/gal). The coating is free of any solvent odors. K-FLEX® 374 Protective Coating can be used to protect elastomeric duct liner from UV degradation when UV sterilization lights are used within the air handling system. It is 25/50-rated when tested to ASTM E84 standards and contains an EPA-registered (#50534-115-1100) antimicrobial agent for mold and mildew control. K-FLEX® 374 Protective coating meets LEED requirements for architectural non-flat paint when used indoors.

OUTDOOR APPLICATIONS

K-FLEX® 374 Protective Coating offers protection from the harmful effects of UV rays when applied to insulation outdoors. It should not be confused as a waterproof mastic, and should not be used in areas where water ponding could occur.

Caution: Use with adequate ventilation; do not take internally. In an emergency, call a physician immediately. Avoid contact with eyes. In case of eye contact, flush with large amounts of water and call physician. Close container after use. Avoid prolonged or repeated breathing of vapor and contact with skin. Keep out of reach of children.

PHYSICAL PROPERTIES	
Color	White
Weight per gallon	11.4 lbs. per gallon
Base	Water
Solids Content	57% by weight
Viscosity	Medium Syrup
Application	Brush, Roller or Spray
Coverage	300 square feet per gallon
Shelf Life	• 1 year in original sealed container • Storage temperature 60°F to 80°F (16°C to 27°C) • Keep from freezing
Drying Time	Touch: 1 Hour, Through: 24 Hours
Container Size	One-Gallon Cans
Flammability	Water-Based; ASTM E84: 5/5 rating
Freight Classification	Protective Coating Paint, non-flammable, Class 55
VOC Content	Less than 0.1 lbs/gal or 0.01 g/l

K-FLEX® 373 CONTACT ADHESIVE TECHNICAL INFORMATION

Made in USA

DESCRIPTION

K-FLEX® 373 Contact Adhesive is an air-drying solvent-based neoprene contact adhesive (blue in color for easy identification) that is excellent for joining seams and butt joints of elastomeric pipe and sheet insulation. K-FLEX® 373 Contact Adhesive will make a resilient moisture- and heat-resistant bond when used with elastomeric products. It is designed for spray application, giving excellent coverage with rapid build-up of strength. Conventional spray heads for solvent based adhesives work with this product.

Caution: Adhesive contains notable solvents and containers not in use should be kept closed. Keep adhesive away from sparks and open flames. Use with adequate ventilation and avoid excessive contact with the skin.

USES

K-FLEX® 373 Contact Adhesive may be used for bonding elastomeric products to a variety of materials (i.e., other elastomers, metal, plastics, wood, etc.,) The adhesive will make a resilient and heat-resistant bond. It is suitable for line temperatures up to 220°F (104°C) on applications requiring bonded seams and joints. When the adhesive is applied to large flat or curved surfaces, it is suitable for temperatures up to 200°F (93°C). The product is supplied in a variety of sizes ranging from 1/2 pint brush top containers to gallon containers. Larger containers are available upon request.

APPLICATION INSTRUCTIONS

For proper adhesion, the surfaces to which the insulation is to be applied must be thoroughly clean, dry and unheated. Primed and painted surfaces should be adhesive tested to be sure the insulation will not lift off after application. The adhesive should be thoroughly mixed. Brush, roll, or spray a thin even coat of adhesive on both surfaces to be joined. Allow the adhesive films to become dry to the touch, but tacky, before joining the surfaces. Press the two surfaces together. Be sure the insulation is in the desired position before the adhesive surfaces make initial contact, since the adhesive forms an instant bond and repositioning after contact is difficult. Moderate pressure should then be applied to the entire bonding area to ensure complete contact. Avoid heat, sparks, and open flames and use only with proper ventilation. Close container after use. K-FLEX® 373 Contact Adhesive should be applied at above 40°F (4°C) temperatures, and allowed to dry for 24 hours before equipment operation. Protective coatings can be applied to applications with bonded joints and seams, after allowing 24 hours dry time. Applications such as large tanks, or vessels where full adhesive coverage is required, must be allowed to dry 7 days prior to applying a protective coating.

K-FLEX® 373 Contact Adhesive may be heat or solvent reactivated. To reactivate heat, use approximately 250°F (125°C). To reactivate solvent, wipe with a cloth dampened with toluene.

Note: May damage the insulation if the intent is to remove it from the substrate (i.e. duct, tank, AHU, etc.)

Thinning the adhesive is not recommended. Common lacquer thinners can be used for clean up. *See the Technical Bulletin TA1 for equipment recommendations.*

PHYSICAL PROPERTIES	
Color	Blue
Base	Synthetic Rubber
Solvents	Aliphatic, Aromatic and Ketone
Viscosity	Thin Syrup
Solid Content	20% by Weight
Weight per gallon	6.8 lbs./gallon
Coverage	200-300 sq. ft. per gallon (one surface)
Shelf Life	One year in original sealed container - Storage temperature 60°F.
Minimum Dry Time	• 5-10 minutes under normal conditions, shorter for spray application • (Drying can be accelerated by using forced ventilation and/or heat.)
Open Time	Not to exceed 10 minutes
Temperature Limits	• 220°F (104°C) for pipe insulation seams and joints • 200°F (93°C) for full bonding sheets
Flash Point	Less than -4°F
Specification Compliance	Meets Mil A 24179A Type 2 Class 1 Amendment 2(QPL# RUBQA-373)
Flammability	Underwriter Laboratories listed UL 723 (Flame Spread 5) (Smoke Density 5)
Freight Classification	• Adhesive NOS. Flammable Liquid 4620 Sub 5, Class 60, UN 1133, IMDG class 3.1 • PG:11 (packaging group II)

K-FLEX® 320/620 CONTACT ADHESIVE TECHNICAL INFORMATION

Made in USA

DESCRIPTION

K-FLEX® 320 & 620 Contact Adhesives are air-drying solvent-based neoprene contact adhesives that are excellent for joining seams and butt joints of elastomeric & polyolefin pipe and sheet Insulation. K-FLEX® 320 & 620 Contact Adhesives make resilient moisture- and heat-resistant bonds when used with elastomeric and polyolefin products. K-FLEX® 320 & 620 Contact Adhesives' higher solids content allows them to be brushed or roller applied easily without running. They are ideal for bonding porous and non-porous materials, as they will not be absorbed easily.

Caution: Adhesive contains notable solvents and container not in use should be kept closed. Keep adhesive away from sparks and open flames. Use with adequate ventilation and avoid excessive contact with the skin.

USES

K-FLEX® 320 & 620 Contact Adhesives may be used for bonding elastomeric and polyolefin products to a variety of materials (i.e., other elastomers, metal, wood, leather, felt, concrete, etc.). The adhesives will make resilient and heat-resistant bonds. They are suitable for line temperatures up to 220˚F (104˚C) on applications requiring bonded seams and joints. When the adhesives are applied to large flat or curve surfaces, they are suitable for temperatures up to 200˚F (93˚C). The products are supplied in a variety of sizes ranging from pint brush top containers to gallon containers. Larger containers are available upon request.

APPLICATION INSTRUCTIONS

For proper adhesion, the surfaces to which the insulation is to be applied must be thoroughly cleaned, dry and unheated. Primed and painted surfaces should be adhesive tested to be sure the insulation will not lift off after application. The adhesive should be thoroughly mixed. Brush or roll a thin even coat of adhesive on both surfaces to be joined. Allow the adhesive films to become dry to the touch, but tacky, before joining the surfaces. Press the two surfaces together. Be sure the insulation is in the desired position before the adhesive surfaces make initial contact, since the adhesive forms an instant bond, and repositioning after contact is difficult. Moderate pressure should then be applied to the entire bonding area to ensure complete contact. Avoid heat, sparks, and open flames, and use only proper ventilation. Close container after use. K-FLEX® 320 & 620 Contact Adhesives should be applied at above 40˚F (4˚C) temperatures, and allowed to dry for 24 hours before equipment operation. Protective coatings can be applied to applications with bonded joints and seams, after allowing 24 hours dry time. Applications such as large tanks, or vessels where full adhesive coverage is required, must be allowed to dry 7 days prior to applying a protective coating.

The surface may be allowed to dry and can be solvent reactivated by wiping with a toluene dampened cloth.

Thinning the adhesive is not recommended. Common lacquer thinners can be used for clean up.

PHYSICAL PROPERTIES	
Color	Amber (320), Black (620)
Base	Neoprene
Solvents	Toluene, Hexane, Acetone
Viscosity	Medium Syrup
Solid Content	25% ± 2%
Weight per gallon	6.98± .2 lbs.
Coverage	200 sq. ft. per gallon (one surface)
Shelf Life	One year in original sealed container. Storage temperature 60°F
Minimum Dry Time	2-4 minutes under normal conditions
Open Time	Not to exceed 10 minutes
Temperature Limits	220°F (104°C) for pipe insulation seams and joints 200°F (93°C) for full bonding sheets
Flammability	ASTM E84 10/0 Flamespread/Smoke Developed
Flash Point	Less than -4°F
Freight Classifications	• Adhesives NOS. Flammable Liquid 4620 Sub 5, class 60, Un 1133, IMDG class 3.1 • PG:11 (packaging group II)

K-FLEX® 720 LVOC CONTACT ADHESIVE TECHNICAL INFORMATION

Made in USA

DESCRIPTION

K-FLEX® 720-LVOC Contact Adhesive is an air-drying solvent-based (acetone) contact adhesive that is excellent for joining seams and butt joints of elastomeric pipe and Sheet Insulation. It is black in color for excellent aesthetics. K-FLEX® 720-LVOC Contact Adhesive forms a tough, flexible moisture- and heat-resistant bond when used with elastomeric products. K-FLEX® 720-LVOC Contact Adhesive's lower viscosity allows it to be applied easily. It is ideal for bonding porous and non-porous materials, as it will not be absorbed easily. K-FLEX® 720-LVOC Contact adhesive also meets Southcoast Air Quality Management Rule 1168 (SCAQMD) and LEED (Leadership in Energy and Environmental Design) VOC emission regulations.

Caution: *Adhesive contains notable solvents and container, when not in use, should be kept closed. Keep adhesive away from sparks and open flames. Use with adequate ventilation and avoid excessive contact with the skin.*

USES

K-FLEX® 720-LVOC Contact Adhesive may be used for bonding elastomeric products to a variety of materials (i.e., other elastomers, metal, wood, leather, felt, concrete, etc.). The adhesive will make a resilient and heat-resistant bond. It is suitable for line temperatures up to 250˚F (121˚C) and 300˚F (150˚C) intermittent on applications requiring bonded seams and joints. When the adhesive is applied to large flat or curve surfaces, it is suitable for temperatures up to 200˚F (93˚C). The product is supplied in quarts. It contains no halogens, making it ideal for use with K-FLEX ECO™ (non-halogen) insulation.

APPLICATION INSTRUCTIONS

For proper adhesion, the surfaces to which the insulation is to be applied must be thoroughly cleaned, dry and unheated. Primed and painted surfaces should be adhesive tested to be sure the insulation will not lift off after application. The adhesive should be thoroughly mixed. Brush or roll a thin even coat of adhesive on both surfaces to be joined. Allow the adhesive films to become dry to the touch, but tacky, before joining the surfaces. Press the two surfaces together. Be sure the insulation is in the desired position before the adhesive surfaces make initial contact, since the adhesive forms an instant bond, and repositioning after contact is difficult. Moderate pressure should then be applied to the entire bonding area to ensure complete contact. Avoid heat, sparks, and open flames, and use only proper ventilation. Close container after use.

K-FLEX® 720-LVOC Contact Adhesive should be applied at above 40˚F (4˚C) temperatures, and allowed to dry for 24 hours before equipment operation. Protective coatings can be applied to applications with bonded joints and seams, after allowing 24 hours dry time. Applications such as large tanks, or vessels where full adhesive coverage is required, must be allowed to dry 7 days prior to applying a protective coating. Thinning the adhesive is not recommended. Common lacquer thinners (Xylol or Trichloroethylene) can be used for clean up.

PHYSICAL PROPERTIES	
Color	Black
Solvents	Acetone
Viscosity	Medium Syrup (3,500 cP)
Weight per gallon	7.2± .2 lbs.
Shelf Life	6 months in original sealed container. Storage temperature 60°F
Minimum Dry Time	2-4 minutes under normal conditions (1-10 minutes depending on conditions)
Open Time	Not to exceed 10 minutes
Temperature Limits	250°F (121°C) for pipe insulation seams and joints 200°F (93°C) for full bonding sheets
Chemical Resistance	Resistant to moisture, aliphetic solvents, and oils
VOC (Theoretical method)	0 gram/liter
Flash Point	-4°F (-20°C)
Freight Classifications	• Adhesives NOS. Flammable Liquid 4620 Sub 5, class 60, Un 1133, IMDG class 3.1 • PG:II (Packaging Group) • Meets EPA 40 CFR - 59 sub part 1, or SCAQMD Rule 1168 and LEED requirements
Odor	Pungent Solvent
Solid Content	26%
Coverage	200 sq. ft. per gallon

K-FLEX® 360 INSULATED PIPE SUPPORT TECHNICAL INFORMATION

Made in USA

DESCRIPTION

Pipe supports create a unique insulation problem. The weight of the pipe being placed in the support can compress the insulation, reducing thickness and creating a thermal short circuit that results in potential condensation formation. The K-FLEX® 360 Insulated Pipe Support is one answer to this problem.

K-FLEX® 360 Insulated Pipe Supports are specifically designed to ensure that the thickness of the insulation is not reduced by the weight of the pipe. The hinged, 360° position-free, rigid polyurethane core has a high compressive load. It is joined by two elastomeric insulation collars which provide the ideal surface to adhere elastomeric tubular insulation using contact adhesive. The vapor barrier is guaranteed by the outer PVC jacket with overlapping tab system.

The K-FLEX® 360 Insulated Pipe Support system ensures proper insulation thickness and continuity of the vapor barrier. It is available in all common IDs in 1/2" to 1-1/2" wall thicknesses.

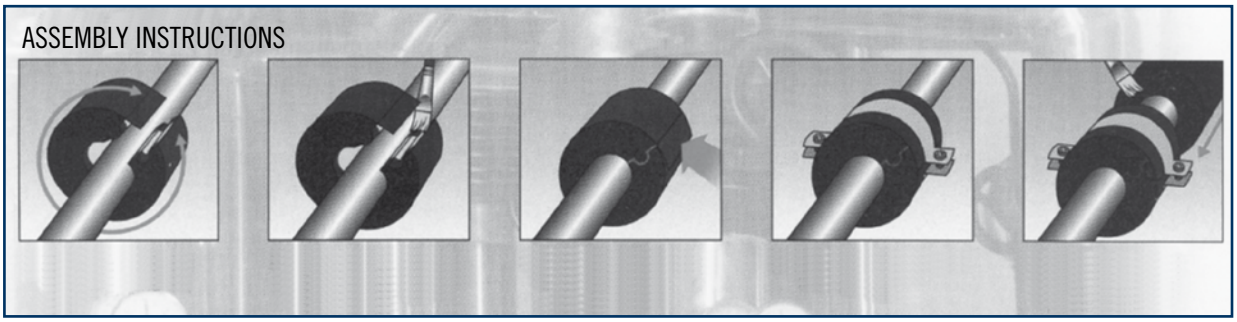
INSTALLATION

Using the K-FLEX® 360 Insulated Pipe Support system is extremely easy. Simply select the correct ID and wall thickness from the wide range of sizes available to match the pipe insulation being used. Place the insulating support around the pipe. After applying Contact Adhesive to the grooved seams, pull the release strip in the overlapping tab and seal the support. Fix the metal pipe hanger collar around the support system. Adhere the support to the elastomeric insulating material using Contact Adhesive.

K-FLEX® 360 Insulated Pipe Supports provide a quick, reliable alternative to traditionally recommended, more time-consuming solutions. K-FLEX® 360 Insulated Pipe Supports eliminate insulation gaps and ensure proper insulation thickness at load-bearing hanger points. This helps to maintain total insulation system integrity.

PHYSICAL PROPERTIES		
Polyurethane Core		Density 5 pcf
Compressive Strength		72 psi
Working Temperature Range		-50°F to 220°F
Thermal Conductivity (k value)		0.25 Btu-in/hr.-ftsq-F
Water Vapor Permeability (max.)		0.10 perm – in.
Dimensional Tolerances	Inside	+/- 0.040"
	Outside	+/-0.100"

ASSEMBLY INSTRUCTIONS



1 - Place the insulating support around the pipe.
Clamp not included.

2 - Apply the K-FLEX contact adhesive to the half-collars.

3 - Seal the support by overlapping the adhesive tabs.

4 - Fix your collar around the support.

5 - Glue the support to the insulating material.

K-FIT®
prefabricated fittings

K-FIT® PREFABRICATED FITTINGS

BENEFITS:

- Quicker installation
- Reduced labor costs
- Great Fit
- Water-tight seams

K-FIT® PREFABRICATED FITTINGS ARE AN INNOVATIVE SOLUTION to insulating pipe elbows, curvatures and intersections. The fittings come in a variety of sizes for 90s, 45s, Tees, and P-Traps in standard black, white and K-FLEX ECO™ elastomeric products. Instead of fabricating your fittings in the field, allow K-FIT® fittings to get you through the job quicker and with enhanced performance.

Save time and money in the field by purchasing K-FIT® prefabricated fittings!

K-FIT® TECHNICAL INFORMATION

Made in USA

Contains a Protective Antimicrobial Agent

DESCRIPTION

K-FIT® Prefabricated Fittings are the easiest, most reliable way to insulate pipe elbows, curvatures and intersections. They are produced under controlled conditions in our manufacturing facility using an automated process to ensure uniformity, compression fit and water-tight seams.

K-FIT® Prefabricated Fittings are available in wall thicknesses of 1/2", 3/4", 1", 1-1/4" and 1-1/2" in sizes ranging from 3/8" I.D. to 6" IPS. In addition, they are available in Grooved Pipe sizes. K-FIT® Prefabricated Fittings are available in 45's, 90's, P-Trap and Tee's in all K-FLEX elastomeric products - Black, White, and K-FLEX ECO™.

K-FIT® Prefabricated Fittings are non-porous, fiber-free, environmentally friendly, CFC-free, and resist mold growth.

APPLICATIONS

K-FIT® Prefabricated Fittings are used to retard heat gain and prevent condensation or frost formation on refrigerant lines, cold water plumbing, and chilled water systems. They also retard heat loss for hot water plumbing, liquid heating, dual temperature piping and solar systems. K-FIT® Prefabricated Fittings are manufactured from standard insulation and are recommended for applications ranging from -297˚F to 220˚F (-182˚C to 104˚C). Fittings manufactured from K-FLEX ECO™ have a temperature range up to 300˚F (150˚C). The expanded closed cell structure makes K-FIT® Prefabricated Fittings an efficient insulator and an effective moisture vapor retarder.

INSTALLATION

Installation of K-FIT® Prefabricated Fittings are easy, fast and provide a reliable installation system. For best installation results, apply fittings prior to straight run insulation.

Step 1: Slit Fitting.
Step 2: Apply contact adhesive to longitudinal seam (both surfaces).
Step 3: Allow adhesive to become tacky.
Step 4: Apply fitting to pipe.
Step 5: Apply pressure to seam.
Step 6: Install straight pipe insulation and adhere to fittings.

K-FIT® P-Traps are specifically designed to fit Mueller Industries Suction Line P-Traps. K-FLEX USA will not warrant the fit of its K-FIT® P-Trap for any other manufacturer's suction line P-Trap.

OUTDOOR APPLICATIONS

K-FIT® Prefabricated Fittings are made from a UV-resistant elastomeric blend. For moderate UV exposure applications, no additional protection is needed. However, for severe UV exposure applications (rooftop applications) or where optimum performance is required, K-FLEX® 374 Protective Coating, appropriate jacketing or K-FLEX Clad® AL should be used. For more detailed information refer to the *Installation Guide*.

RESISTANCE TO MOISTURE VAPOR FLOW

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

FLAME AND SMOKE RATING*

K-FIT® Prefabricated Fittings in wall thicknesses of 1-1/2" (38 mm) and below have a flame spread rating of 25 or less and a smoke development rating of 50 or less as tested according to ASTM E 84, *"Surface Burning Characteristics of Building Materials"*.

K-FIT® Prefabricated Fittings are acceptable for use in duct/plenum applications meeting the requirements of NFPA 90A/B. This does not apply to fittings made from K-FLEX ECO™.

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.

K-FIT® TECHNICAL INFORMATION

PHYSICAL PROPERTIES K-FIT®*					
ATTRIBUTE	**K-FIT® BLACK**	**TEST METHODS**	**ATTRIBUTE**	**K-FIT® BLACK**	**TEST METHODS**
Temperature Range	-297°F to +220°F (-182°C to +104°C)	ASTM C 411	Odor	Negligible	
Thermal Conductivity BTU-in/ hr-ft²-°F 75°F Mean temp	0.245	ASTM C 177, ASTM C 518	Ozone resistance	Good	ASTM D 1171
Water vapor permeability	0.03 perm-in	ASTM E 96	% closed cells	>90	
Water absorption %	<0.20 by volume	ASTM C 209	Dimensional Stability	<4.0@ 220°F	ASTM C 534
Resistance to oil & greases	Good		Flame Spread (up to 1-1/2" wall)	Not greater than 25	ASTM E 84
Density	3 pcf to 6 pcf	ASTM D 1622, ASTM D 3575	Smoke Developed (up to 1-1/2" wall)	Not greater than 50	ASTM E 84
Resistance to U.V. & weather	Good[1]		Flexibility	Excellent	

** For technical information regarding K-FIT® White and K-FIT® ECO please see separate product sheet.*
1 Outdoor applications should be protected with K-FLEX® 374 Protective Coating (2 or more coats may be required), approved jacketing or K-FLEX Clad® AL or WT, applied to the recommended thickness.

THICKNESS RECOMMENDATIONS* - TO CONTROL CONDENSATION								
PIPE SIZE	**LINE TEMP**		**LINE TEMP**		**LINE TEMP**		**LINE TEMP**	
	50°F	**10°C**	**35°F**	**2°C**	**0°F**	**-18°C**	**-20°F**	**-29°F**
Normal Conditions (Max 85°F, 29°C - 70% R.H.)								
3/8" I.D. thru 1-3/8" I.D.	3/8"	10 mm	1/2"	13 mm	3/4"	19 mm	1"	25 mm
Over 1-3/8" thru 3" IPS	3/8"	10 mm	1/2"	13 mm	1"	25 mm	1"	25 mm
Over 3" IPS thru 4" IPS	1/2"	13 mm	1/2"	13 mm	1"	25 mm	1-1/2"	38 mm
Over 4" IPS	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.)								
Over 2-1/8" thru 3" IPS	3/8"	10 mm	3/8"	10 mm	1/2"	13 mm	1/2"	13 mm
Over 2-1/8" thru 3" IPS	3/8"	10 mm	3/8"	10 mm	1/2"	13 mm	3/4"	19 mm
Over 3" IPS thru 4" IPS	1/2"	13 mm	1/2"	13 mm	3/4"	19 mm	3/4"	19 mm
Over 4" IPS	1/2"	13 mm	1/2"	13 mm	3/4"	19 mm	3/4"	19 mm
Severe Conditions (Max 90°F, 32°C - 80% RH)								
3/8" I.D. thru 1-1/8" I.D.	3/4"	19 mm	3/4"	19 mm	1-1/2"	38 mm	1-1/2"	38 mm
Over 1-1/8" I.D. thru 4" IPS	3/4"	19 mm	1"	25 mm	1-1/2"	38 mm	1-1/2"	38 mm
Over 4" IPS	3/4"	19 mm	1"	25 mm	1-3/4"	44 mm	2"	50 mm

**K-FIT® in thickness noted within the specified temperature ranges will prevent condensation on indoor piping under design conditions defined below. Thickness recommendations above 1-1/2" can be sleeved to achieve thickness desired.*
***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)*

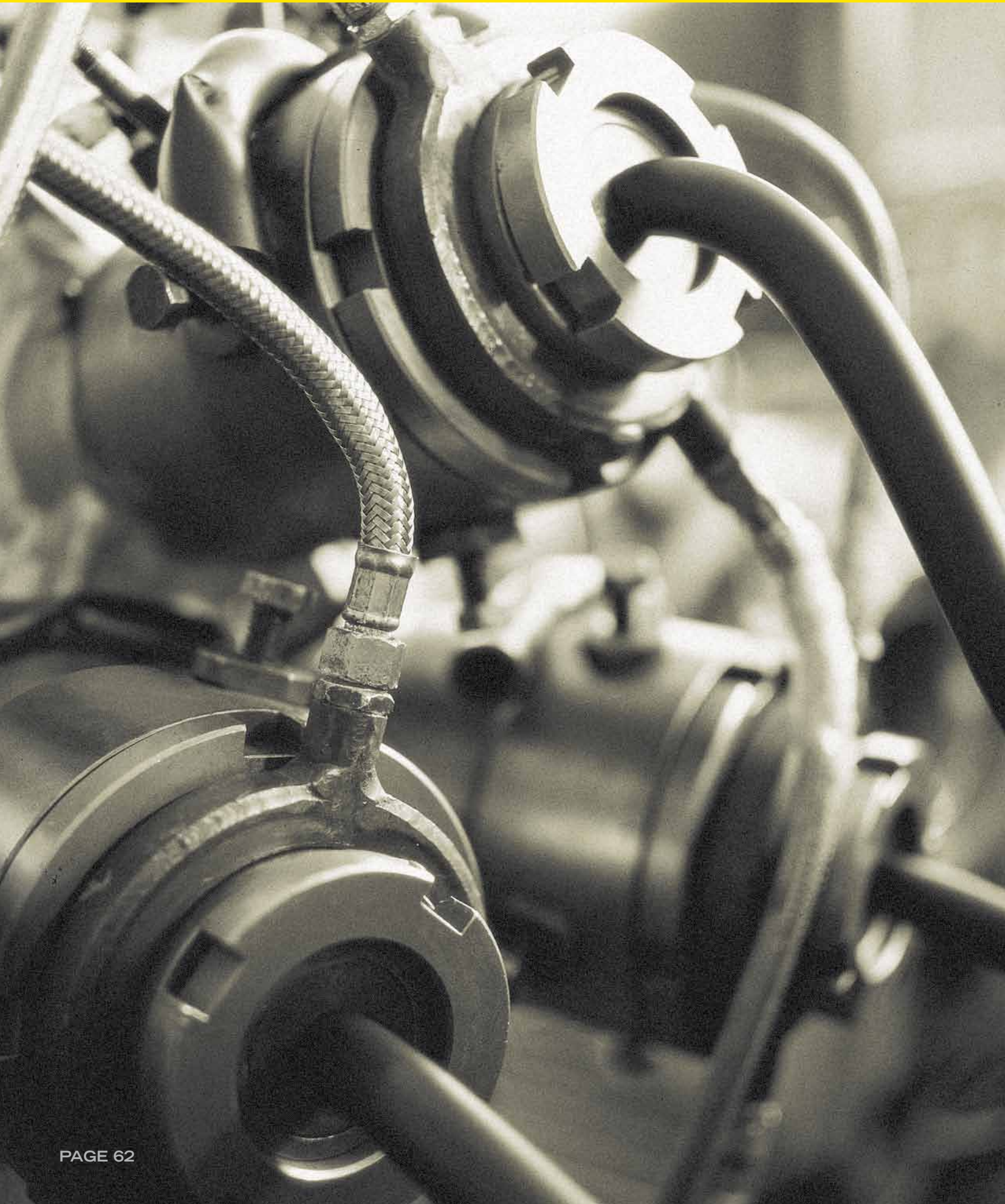
K-FIT® "R" VALUES PER SQUARE FOOT							
PIPE O.D OR NOMINAL INSULATION I.D.		R VALUE 3/8" (10 mm) WALL	R VALUE 1/2" (13 mm) WALL	R VALUE 3/4" (19 mm) WALL	R VALUE 1" (25 mm) WALL	R VALUE 1-1/4" (32 mm) WALL	R VALUE 1-1/2" (38 mm) WALL
3/8"	10 mm	2.7	3.6	5.6	——	——	——
1/2"	13 mm	2.5	3.4	5.4	——	——	——
5/8"	16 mm	2.5	3.3	5.4	7.5	10.5	12.8
3/4"	19 mm	2.3	3.1	5.4	7.5	9.9	12.1
7/8"	22 mm	2.3	3.2	5.4	7.2	9.5	11.6
1-1/8"	29 mm	2.3	3.1	5.5	7.1	8.9	10.8
1-3/8"	35 mm	2.2	3.2	5.3	7.3	8.4	10.2
1-5/8"	41 mm	2.4	3.1	5.1	7.1	8.1	9.8
1-1/2" IPS	48 mm	2.3	3.0	4.9	6.7	7.7	9.3
2-1/8"	54 mm	2.3	3.0	4.9	6.8	7.6	9.2
2" IPS	60 mm	2.3	2.9	4.8	6.5	7.4	9.0
2-1/2" IPS	64 mm	2.3	3.0	4.6	6.3	7.2	8.6
2-5/8"	67 mm	2.3	3.1	4.7	6.4	7.3	8.8
3-1/8"	79 mm	2.3	3.0	4.6	6.2	7.1	8.5
3" IPS	89 mm	2.3	3.2	4.6	6.1	7.0	8.3
3-5/8"	92 mm	2.3	3.2	4.6	6.1	6.9	8.3
4-1/8"	105 mm	2.3	3.1	4.6	6.0	6.8	8.1
4" IPS	114 mm	2.3	3.2	4.7	6.0	6.8	8.1
5" IPS	140 mm	——	3.2	4.5	5.9	6.6	7.8
6" IPS	168 mm	——	3.1	4.5	5.8	6.5	7.6

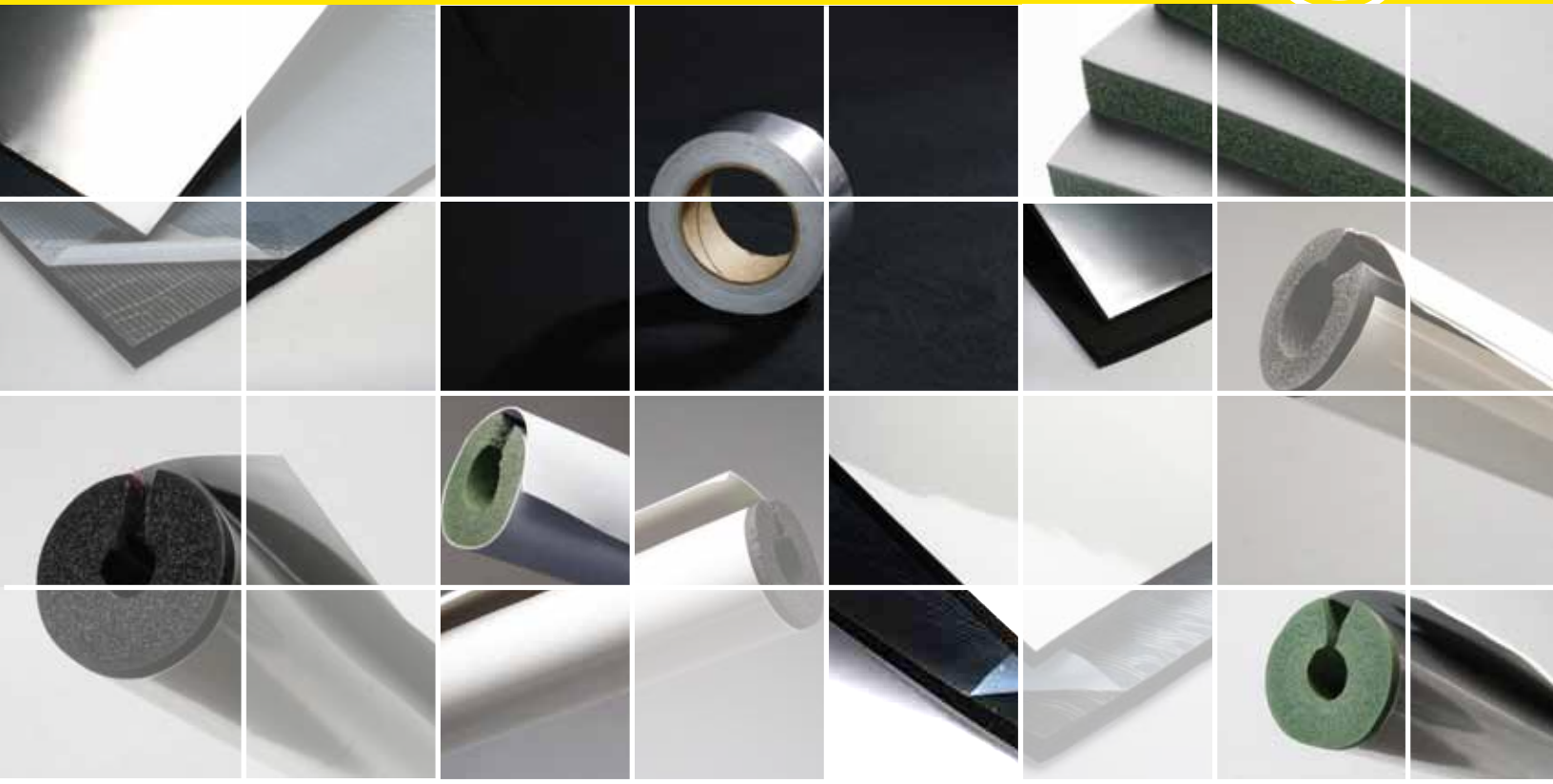
Note: "R" factors were calculated using a K factor of 0.245 (at 75°F, 24°C mean temp.) and nominal wall thickness is each case. Lower operating temperatures will result in improved R values. Contact Technical Services for specific recommendations.

SPECIFICATION COMPLIANCE*

- ASTM C 534 Type 1 (Tubing), Type 1 / Grade 3 (ECO)
- 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)
- ASTM E 84 1-1/2" 25/50-tested according to UL 723 and NFPA 255
- Complies with requirements of CAN/ULC S102-M88
- FMRC Approval Guide Chapter 14 Pipe Insulation
- NFPA No. 101 Class A Rating
- Meets requirements of NFPA 90A Sect. 2.3.3 for Supplementary Materials for Air Distribution Systems
- Meets requirements of ASTM C 411 (Test Method for Hot Surface Performance of High Temperature Thermal Insulation)
- Meets requirements of UL 181 sections 11.0 and 16.0 (Mold Growth/Air Erosion)
- GREENGUARD® certified under the "Children & Schools" and "Indoor Air Quality" classifications
- Meets energy code requirements of ASHRAE 90.1 and 189.1

* Not applicable to K-FLEX ECO™





K-FLEX CLAD®

factory applied cladding

K-FLEX CLAD® AL 1-STEP APPLICATION TO SAVE ON INSTALLATION TIME

For specific installation instructions see K-FLEX Clad® installation guide

K-FLEX CLAD® AL is a complete elastomeric insulation system coupled with a multi-layered covering, resistant to ultraviolet rays and atmospheric agents. Because of its excellent physical properties, K-FLEX CLAD® AL is extremely robust and shock-resistant, reduces application time and is easy to maintain. The K-FLEX CLAD® AL system offers a wide range of products and accessories to meet all the installer's requirements.

BENEFITS:

- 1-step installation
- Reliable performance
- Minimal maintenance
- UV Resistant

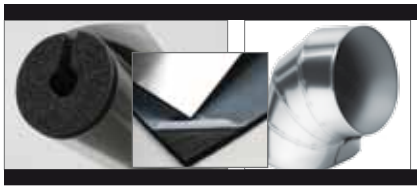
APPLICATIONS:

Refrigeration
Air conditioning
Heating & Plumbing
Industry

SPECIFICATION COMPLIANCE

- ASTM C 534 Type 1 (Tubing), Grade 1
- USDA Compliant
- RoHS Compliant
- ASTM E84 1-1/2" 25/450-tested according to UL 723 and NFPA 255
- Complies with requirements of CAN/ULC S102-M88

K-FLEX CLAD® AL TECHNICAL INFORMATION



Made in USA

Contains a Protective Antimicrobial Agent

DESCRIPTION

K-FLEX Clad® AL, available in tube or sheet form, is a composite product comprised of closed cell elastomeric insulation adhered to a plastic sheet laminated to aluminum foil.

K-FLEX Clad® AL is fiber-free, non-porous, CFC- and HCFC-free. K-FLEX Clad® AL is GreenGuard® certified as a low VOC material, meeting the requirements of the *"Indoor Air Quality"* classification. These characteristics allow it to comply with Health, Safety and Environmental requirements.

K-FLEX Clad® AL tubes are available in 1/2", 1" and 1-1/2" wall thicknesses in 3 foot lengths. Sheet product is available in 36" x 48" dimensions or 48" wide rolls up to 2" thick. Sheets and rolls up to 1-1/2" thick are available with an aggressive pressure sensitive adhesive (PSA) with fiberglass scrim reinforcement and a moisture/tear resistance polyolefin easy release liner.

The plastic / aluminum cladding provides a secondary moisture vapor barrier to the inherently moisture-resistant closed cell foam core.

APPLICATIONS

K-FLEX Clad® AL is an ideal choice for outdoor applications (roof top), food processing plants, pharmaceutical facilities, film processing, electronics and other clean room applications subject to code compliance. K-FIT® factory-fabricated fittings and Clad® AL Covers complete the installation.

The cladding provides weather and abuse resistance, as well as protection from UV rays. The smooth shiny surface is easy to clean, dust-free, resistant to acids, alkali, salts, oil, fats, and aliphatic hydrocarbons, and is highly impermeable to gases and moisture. Cladding does not dent like traditional metal jackets, has excellent appearance and is easy to maintain. The K-FLEX Clad® AL system allows for quick and easy replacement if necessary. Standard K-FLEX Clad® AL can be used within a wide range of temperatures from -297°F to +220°F. K-FLEX Clad® AL - ECO should be requested as the foam core on stainless steel applications above 100°F. The temperature range for K-FLEX Clad® AL - ECO is from -297°F to +300°F.

INSTALLATION

A unique overlap closure system, which eliminates through seams on longitudinal seams, ensures against moisture penetration. Light and easy to handle, the K-FLEX Clad® AL system provides installed cost savings over traditional metal jacket or mastic systems with improved performance. K-FLEX® Rivets are included with the tube product and should be applied along the longitudinal seam during installation. For complete installation instructions, reference the *K-FLEX Clad® AL systems installation guide*.

The all inclusive insulation system with factory-applied finish and a full range of accessories.

PHYSICAL PROPERTIES OF ALUMINUM LAMINATE MATERIAL		
PROPERTIES	**K-FLEX CLAD® AL**	**TEST METHODS**
Thickness	0.016"	
Reaction to Fire	25/450	ASTM E 84
Water Vapor Permeability	0.001 perm-in	ASTM E 96
Weather, UV Resistance	Excellent	ASTM G 53
Corrosion Risk	The system provides protection for corrosion under insulation	
Salt Spray Resistance	Excellent	BS 903 F12
Wear Resistance	Excellent	BS 903 A2
Ozone Resistance	Excellent	BS 903 A43, ASTM D 1171
Chemical Resistance	Excellent	Acids, Alcohols, Alkalies, Oils
Emissivity	0.80	ASTM C 1371
Color	Silver	
PHYSICAL PROPERTIES OF ELASTOMERIC CORE MATERIAL (STANDARD)		
Temperature Range/Sheet	-297°F to +220°F (-182°C to +104°C)	ASTM C 411
Color	Black	
Thermal Conductivity (75°F Mean temp)	0.245 BTU-in/hr-ft^2-°F	ASTM C 177, ASTM C 518
Water vapor permeability	0.03 perm-in	ASTM E 96
Water absorption %	<0.2 by volume	ASTM C 209
Resistance to oil & greases	Good	
Density	3 to 6 lbs. pcf	ASTM D 1622, ASTM D 3575
Resistance to U.V. & weather	Good	
Odor	Negligible	
Ozone resistance	Good	
% closed cells	>90	ASTM D 1171
Dimensional Stability	<4.0 @ 220°F	ASTM C 534
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
Flexibility	Excellent	
PHYSICAL PROPERTIES OF COMPOSITE SYSTEM		
Water Vapor Permeability	0.001 perm-in	ASTM E 96

K-FLEX CLAD® WT PERFECT FOR INDOOR APPLICATIONS

For specific installation instructions see K-FLEX Clad® installation guide

K-FLEX CLAD® WT HAS A WHITE FINISH which makes it perfect for indoor applications where piping systems are exposed and cleanability and appearance are important. The clad jacketing meets the 25/50 flame spread / smoke development standard when tested to ASTM E 84 standards and will not dent or wrinkle when exposed to mechanical abuse. K-FLEX CLAD® WT tubing is certified by NSF International for NSF/ANSI Standard 169, *"Special Purpose Food Equipment and Devices"*.

BENEFITS:

- Easy to install
- Improved Reliability
- Minimal Maintenance
- Insulation can be installed before building is enclosed

APPLICATIONS:

- Indoor applications
- Food Processing Plants
- Other clean room applications

SPECIFICATION COMPLIANCE

- ASTM C 534 Type 1 (Tubing), Grade 1
- USDA Compliant
- RoHS Compliant
- ASTM E84 1-1/2" 25/50-tested according to UL 723 and NFPA 255
- Complies with requirements of CAN/ULC S102-M88
- NSF/ANSI Standard 169

K-FLEX CLAD® WT TECHNICAL INFORMATION

DESCRIPTION

K-FLEX Clad® WT, available in both tubular and sheet form, is a composite product comprised of closed cell elastomeric insulation adhered to a white PVC/Mylar® film.

K-FLEX Clad® WT is non-porous, fiber-free, CFC- and HCFC-free. K-FLEX Clad® WT is GREENGUARD® certified as a low VOC material, meeting the criteria for the *"Children and Schools"* and *"Indoor Air Quality"* classifications. It complies with Health, Safety and Environmental requirements. K-FLEX Clad® WT tubing is also certified by NSF International for NSF/ANSI Standard 169, *"Special Purpose Food Equipment and Devices"*.

Tubular product is available in all standard ID's in 1/2", 1" and 1-1/2" wall thicknesses in nominal 3 foot lengths. Sheet product is available in 36" x 48" dimensions or 48" wide rolls up to 2" thick. Sheets and rolls up to 1-1/2" thickness are available with an aggressive pressure sensitive adhesive (PSA) with fiberglass scrim reinforcement and a moisture/tear resistant polyolefin easy release liner.

The PVC/Mylar® film composite cladding provides a secondary moisture vapor barrier to the inherently moisture-resistant closed cell foam core and meets 25/50 requirements for flame spread and smoke development when tested according to ASTM E84 standards.

APPLICATIONS

K-FLEX Clad® WT is an ideal choice for outdoor (roof top) and indoor applications, including supermarkets, food processing plants, pharmaceutical facilities, film processing centers, electronics facilities and other clean room applications subject to code compliance. K-FIT® factory-fabricated fittings and K-FLEX Clad® WT Covers complete the installation.

The cladding provides weather and abuse resistance, as well as protection from UV rays. The smooth white surface is easy to clean, dust-free, resistant to acids, alkali, salts, oil, fats, aliphatic hydrocarbons, and is highly impermeable to gases and moisture. Cladding does not dent like traditional metal jackets, has excellent appearance and is easy to maintain. The K-FLEX Clad® WT system allows for quick and easy replacement if necessary.

This composite product has a low thermal conductivity, a high water vapor diffusion resistance factor and greatly reduces the problem of under insulation corrosion. Standard K-FLEX Clad® WT can be used in a temperature range of -297°F to +220°F. The temperature range for K-FLEX Clad® WT - ECO is from -297°F to +300°F.

INSTALLATION

A unique overlap closure system, which eliminates through seams on longitudinal seams, ensures against moisture penetration. Light and easy to handle, the K-FLEX Clad® WT system provides installed cost and time savings over traditional metal jacket, PVC or mastic systems, along with improved performance and less maintenance requirements. Preformed elbows and matching tape allow for a professional and durable installation.

PHYSICAL PROPERTIES OF PVC/MYLAR® FILM LAMINATE MATERIAL		
ATTRIBUTES	**K-FLEX CLAD® WT**	**TEST METHODS**
Thickness	0.012”	
Reaction to Fire	25/50	ASTM E 84
Water Vapor Permeability	0.001 perm-in	ASTM E 96
Weather, UV Resistance	Excellent	ASTM G 53
Corrosion Risk	The system provides protection for corrosion under insulation	
Salt Spray Resistance	Excellent	BS 903 F12
Wear Resistance	Excellent	BS 903 A2
Ozone Resistance	Excellent	BS 903 A43, ASTM D 1171
Chemical Resistance	Excellent	Acids, Alcohols, Alkalies, Oils
Emissivity	0.80	ASTM C 1371
Color	White	
PHYSICAL PROPERTIES OF ELASTOMERIC CORE MATERIAL (STANDARD)		
Temperature Range/Sheet	-297°F to +220°F (-182°C to +104°C)	ASTM C 411
Color	Black	
Thermal Conductivity (75°F Mean temp)	0.245 BTU-in/hr-ft^2-°F	ASTM C 177, ASTM C 518
Water vapor permeability	0.03 perm-in	ASTM E 96
Water absorption %	<0.2 by volume	ASTM C 209
Resistance to oil & greases	Good	
Density	3 to 6 pcf	ASTM D 1622, ASTM D 3575
Resistance to U.V. & weather	Good	
Odor	Negligible	
Ozone resistance	Good	ASTM D 1171
% closed cells	>90	
Dimensional Stability	<4.0 % @ 220°F	ASTM C 534
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
Flexibility	Excellent	
PHYSICAL PROPERTIES OF COMPOSITE SYSTEM		
Water Vapor Permeability	0.001 perm-in	ASTM E 96

K-FLEX CLAD® WT NS PERFECT FOR SLIDE-ON APPLICATIONS

For specific installation instructions see K-FLEX Clad® installation guide

K-FLEX CLAD® WT NS has a white finish which makes it perfect for indoor slide-on applications where piping systems are exposed and cleanability and appearance are important. The clad jacketing meets the 25/50 flame spread / smoke development standard when tested to ASTM E 84 standards and will not dent or wrinkle when exposed to mechanical abuse. K-FLEX CLAD® WT tubing is certified by NSF International for NSF/ANSI Standard 169, *"Special Purpose Food Equipment and Devices"*.

BENEFITS:

- Easy to install
- Improved Reliability
- Minimal Maintenance
- Insulation can be installed before building is enclosed

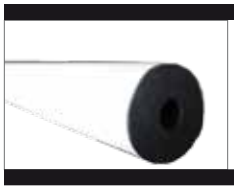
APPLICATIONS:

- Indoor applications
- Food Processing Plants
- Other clean room applications

SPECIFICATION COMPLIANCE

- ASTM C 534 Type 1 (Tubing), Grade 1
- USDA Compliant
- RoHS Compliant
- ASTM E84 1-1/2" 25/50-tested according to UL 723 and NFPA 255
- Complies with requirements of CAN/ULC S102-M88
- NSF/ANSI Standard 169

K-FLEX CLAD® WT NS TECHNICAL INFORMATION



Made in USA

Contains a Protective Antimicrobial Agent

DESCRIPTION

K-FLEX Clad® WT NS, available in tubular form, is a composite product comprised of closed cell elastomeric insulation adhered to a white PVC/Mylar® film.

K-FLEX Clad® WT NS is non-porous, fiber-free, CFC- and HCFC-free. K-FLEX Clad® WT NS is GREENGUARD® certified as a low VOC material, meeting the criteria for the *"Children and Schools"* and *"Indoor Air Quality"* classifications. It complies with Health, Safety and Environmental requirements. K-FLEX Clad® WT NS tubing is also certified by NSF International for NSF/ANSI Standard 169, *"Special Purpose Food Equipment and Devices"*.

K-FLEX Clad® WT NS is available in all standard ID's in 1/2", 1", 1-1/4" and 1-1/2" wall thicknesses in 3-foot lengths.

The PVC/Mylar® film composite cladding provides a secondary moisture vapor barrier to the inherently moisture-resistant closed cell foam core and meets 25/50 requirements for flame spread and smoke development when tested according to ASTM E84 standards.

APPLICATIONS

K-FLEX Clad® WT NS is an ideal choice for outdoor (roof top) and indoor applications, including supermarkets, food processing plants, pharmaceutical facilities, film processing centers, electronics facilities and other clean room applications subject to code compliance. The product is non-slit for slide-on applications. By eliminating a field-applied longitudinal seam, it provides a superior moisture vapor barrier and more reliable performance. K-FIT® factory-fabricated fittings and K-FLEX Clad® WT Covers complete the installation.

The cladding provides weather and abuse resistance, as well as protection from UV rays. The smooth white surface is easy to clean, dust-free, resistant to acids, alkali, salts, oil, fats and aliphatic hydrocarbons, and is highly impermeable to gases and moisture. Cladding does not dent like traditional metal jackets, has excellent appearance and is easy to maintain.

This composite product has a low thermal conductivity, a high water vapor diffusion resistance factor and greatly reduces the problem of under insulation corrosion. Standard K-FLEX Clad® WT NS can be used in a temperature range of -297°F to +220°F.

INSTALLATION

The non-slit, slide-on feature saves time closing seams and increases the reliability of the vapor barrier. K-FLEX Clad® WT NS is light and easy to handle. The K-FLEX Clad® WT NS system provides installed cost and time savings over traditional metal jacket, PVC or mastic systems, along with improved performance and less maintenance requirements. The preformed elbows and matching tape allows for a professional and durable installation.

PHYSICAL PROPERTIES OF PVC/MYLAR® FILM LAMINATE MATERIAL		
ATTRIBUTES	**K-FLEX CLAD® WT NS**	**TEST METHODS**
Thickness	0.012”	
Reaction to Fire	25/50	ASTM E 84
Water Vapor Permeability	0.001 perm-in	ASTM E 96
Weather, UV Resistance	Excellent	ASTM G 53
Corrosion Risk	The system provides protection for corrosion under insulation	
Salt Spray Resistance	Excellent	BS 903 F12
Wear Resistance	Excellent	BS 903 A2
Ozone Resistance	Excellent	BS 903 A43, ASTM D1171
Chemical Resistance	Excellent	Acids, Alcohols, Alkalies, Oils
Emissivity	0.80	ASTM C 1371
Color	White	
PHYSICAL PROPERTIES OF ELASTOMERIC CORE MATERIAL (STANDARD)		
Temperature Range/Sheet	-297°F to +220°F (-182°C to +104°C)	ASTM C 411
Color	Black	
Thermal Conductivity (75°F Mean temp)	0.245 BTU-in/hr-ft^2-°F	ASTM C 177, ASTM C 518
Water vapor permeability	0.03 perm-in	ASTM E 96
Water absorption %	<0.2 by volume	ASTM C 209
Resistance to oil & greases	Good	
Density	3 to 6 pcf	ASTM D 1622, ASTM D 3575
Resistance to U.V. & weather	Good	
Odor	Negligible	
Ozone resistance	Good	ASTM D1171
% closed cells	>90	
Dimensional Stability	<4.0 @ 220°F	ASTM C 534
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
PHYSICAL PROPERTIES OF COMPOSITE SYSTEM		
Water Vapor Permeability	0.001 perm-in	ASTM E 96

K-FLEX CLAD® IN PERFECT FOR LNG APPLICATIONS

For specific installation instructions see K-FLEX Clad® installation guide

K-FLEX CLAD® IN combines elastomeric tube insulation with a tough, gray polymeric clad covering that withstands the most extreme environmental and process conditions. The product withstands rapid thermal shock and vibration making it ideal for outdoor applications where systems require UV, moisture, chemical, acidic and mold resistance in extreme environments.

BENEFITS:

- Easy to install
- Improved Reliability
- Minimal Maintenance
- Prevents corrosion under insulation

APPLICATIONS:

- Outdoor applications
- Industrial Plants
- Liquefied Natural Gas (LNG) Terminals

SPECIFICATION COMPLIANCE

- ASTM C 534 Type 1 (Tubing), Grade 1
- USDA Compliant
- RoHS Compliant
- ASTM E84 1-1/2" 25/350-tested according to UL 723 and NFPA 255
- Complies with requirements of CAN/ULC S102-M88
- Meets IMO requirements for shipbuilding and off-shore platforms (K-FLEX Clad® IN - ECO)

K-FLEX CLAD®IN TECHNICAL INFORMATION

Contains a Protective Antimicrobial Agent

Made in USA

DESCRIPTION

K-FLEX Clad® IN, available in both tubular and sheet form, is a composite product of closed cell elastomeric insulation adhered to a gray polymeric sheet.

K-FLEX Clad® IN is fiber-free, non-porous CFC- and HCFC-free. These characteristics allow it to comply with Health, Safety and Environmental requirements. It provides salt water and impact resistance, as well as UV protection, making it an excellent choice for severe outdoor conditions.

K-FLEX Clad® IN is available in 3-foot length tubes up to 1-1/2" wall thickness. Sheet product is available in 36" x 48" sheets or 36" wide rolls up to 2" thickness.

K-FLEX Clad® IN is available with K-FLEX® LS or with K-FLEX ECO™ insulation. *(See separate data sheet for K-FLEX ECO™ physical properties.)* Full line of accessory products (tape and adhesives) are available.

The polymeric sheet cladding provides a secondary moisture vapor barrier to the inherently moisture resistant closed cell foam core.

APPLICATIONS

K-FLEX Clad® IN is an ideal choice for industrial plants, offshore platforms, FPSO's, LNG Terminals and for the shipbuilding industry. It is well-suited for extreme temperature applications due to the ability of the outer polymeric covering to expand and contract with rapid temperature cycles. K-FLEX Clad® IN - ECO meets IMO requirements for shipbuilding and off-shore platforms.

K-FLEX Clad® IN has a low thermal conductivity, a high water vapor diffusion resistance factor, and practically eliminates the problem of under insulation corrosion. It is easy to install and combines excellent performance with low maintenance requirements. The cladding is flexible enough to protect against damage from traffic (does not dent like traditional metal jackets) and allows for easy maintenance.

K-FLEX Clad® IN with elastomeric insulation core can be used over a wide range of temperatures from -297°F to +220°F (-182°C to +104°C). K-FLEX Clad® IN - ECO (halogen-free) should be used as the core insulation on stainless steel applications above 100°F. The temperature range for K-FLEX Clad® IN - ECO is -297°F to +300°F (-182°C to +150°C).

INSTALLATION

A unique overlap closure system, which eliminates through seams on longitudinal seams, ensures against moisture penetration. No special tools and fewer materials are necessary at the job site, allowing for quick installation.

K-FLEX® 320 Contact Adhesive is an aggressive adhesive specially formulated for the clad jacket and insulation core system and is recommended for longitudinal, butt and overlap seams.

PHYSICAL PROPERTIES OF K-FLEX CLAD® IN POLYMERIC SHEET		
ATTRIBUTES	**K-FLEX CLAD® IN**	**TEST METHODS**
Material Type	Chlorosulfonated Polyethylene	
Thickness	0.30"	
Reaction to Fire	25/350	ASTM E 84
Water Vapor Diffusion	0.001	ASTM E 96
Weather, UV Resistance	Excellent	ASTM G 53
Corrosion Risk	The system provides protection for corrosion under insulation	
Salt Spray Resistance	Excellent	BS 903 F12
Wear Resistance	Excellent	BS 903 A2
Ozone Resistance	Excellent	BS 903 A43, ASTM D1171
Chemical Resistance	Excellent	Acids, Alcohols, Alkalies, Oils
Tensile Elongation	>100%	BS 903 A2
Color	Gray	
PHYSICAL PROPERTIES OF ELASTOMERIC CORE MATERIAL (STANDARD)		
Temperature Range/Sheet	-297°F to +220°F (-182°C to + 104°C)	ASTM C 411
Color	Black	
Thermal Conductivity (75°F Mean temp)	0.245 BTU-in/hr-ft^2-°F	ASTM C 177, ASTM C 518
Water vapor permeability	0.03 perm-in	ASTM E 96
Water absorption %	<0.2 by volume	ASTM C 209
Resistance to oil & greases	Good	
Density	3 - 6 lbs. pcf	ASTM D 1622, ASTM D 3575
Resistance to U.V. & weather	Good	
Odor	Negligible	
Ozone resistance	Good	ASTM D1171
% closed cells	>90	
Dimensional Stability	<4.0 @ 220°F	ASTM C 534
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
PHYSICAL PROPERTIES OF COMPOSITE SYSTEM		
Reaction to Fire	25/350	ASTM E 84, BS 476 Part 7 Cl. 1, IMO RES. A653 (16), Lloyds Register
Normal Climatic Condition (24 weeks)	Non-corrosive, no breakage/blistering	ASTM G7/97

K-FLEX CLAD® TAPE AL TECHNICAL INFORMATION

Made in USA

DESCRIPTION

K-FLEX Clad® Tape - AL is specially designed to complement the K-FLEX Clad® AL line of products. Offered in 2", 4", 6" or 8" widths, the tape has a similar composition to the K-FLEX Clad® AL Tube or Sheet. It provides a quick, easy and uniform way to complete a sealing system. The surface of the tape is comprised of a plastic sheet laminated to alumnium foil, providing a moisture vapor barrier over seams and edges of K-FLEX Clad® AL applications.

Ideal for outdoor applications, the smooth and shiny surface is tough enough to deliver weather and abuse resistance, as well as protection from UV rays.

The surface is also easy to clean and maintain, resistant to impact/traffic (does not dent like traditional metal), acids, alkali, salts, oil, fats, and aliphatic hydrocarbons, and is highly impermeable to gases and moisture, ensuring the integrity of the insulation system. A rubber-based adhesive adheres firmly and forms a long-lasting bond.

APPLICATIONS

After K-FLEX Clad® AL Sheet has been applied to insulate pipes, equipment or air handling systems, K-FLEX Clad® Tape - AL should be applied over all seams and unfinished edges to prevent water intrusion. A 2" wide tape is recommended for seams, while a wider tape is recommended for edges and corners (see chart below), folded to cover both sides. Once applied, go over tape with a plastic squeegee to eliminate wrinkles and air pockets.

PHYSICAL PROPERTIES	K-FLEX CLAD® TAPE AL	TEST METHODS
Thickness	0.016"	
Reaction to Fire	25/450	ASTM E84
Water Vapor Permeability	0.001 perm-in	ASTM E96
Dimensions	2", 4", 6" or 8" width x 75' length roll 4 rolls per carton	
Weather, UV Resistance	Excellent	ASTM G 53
Corrosion Risk	The system provides protection against corrosion under insulation.	
Salt Spray Resistance	Excellent	BS 903 F12
Wear Resistance	Excellent	BS 903 A2
Ozone Resistance	Excellent	BS 903 A43
Chemical Resistance	Excellent	Acids, Alcohols, Alkalies, Oils
Emissivity	0.80	ASTM C1371
Color	Silver	

Recommended tape sizes for edges and corners vary depending on thickness of insulation used:

INSULATION THICKNESS	TAPE WIDTH
½"	4"
1"	6"
1-1/2"	8"
2"	8"

K-FLEX CLAD® TAPE WT TECHNICAL INFORMATION

Made in USA

DESCRIPTION

K-FLEX Clad® Tape - WT is specially designed to complement the K-FLEX Clad® WT line of products. Offered in 2", 4", 6" or 8" widths, the tape has a similar composition to the K-FLEX Clad® WT Tube or Sheet. It provides a quick, easy and uniform way to complete a sealing system.

The surface of the tape is comprised of a white composite PVC/Mylar® film, providing a moisture vapor barrier over seams and edges of K-FLEX Clad® WT applications.

The smooth, tough surface delivers weather and abuse resistance, as well as protection from UV rays. The surface is easy to clean and maintain, resistant to impact/traffic (does not dent like traditional metal), acids, alkali, salts, oil, fats, and aliphatic hydrocarbons, and is impermeable to gases and moisture, ensuring the integrity of the insulation system.

A rubber-based adhesive adheres firmly and forms a long-lasting bond.

APPLICATIONS

After K-FLEX Clad® WT Sheet has been applied to insulate pipes, equipment or air handling systems, K-FLEX Clad® Tape - WT should be applied over all seams and unfinished edges to prevent water intrusion. A 2" wide tape is recommended for seams, while a wider tape is recommended for edges and corners (see chart below), folded to cover both sides. Once applied, go over tape with a plastic squeegee to eliminate wrinkles and air pockets.

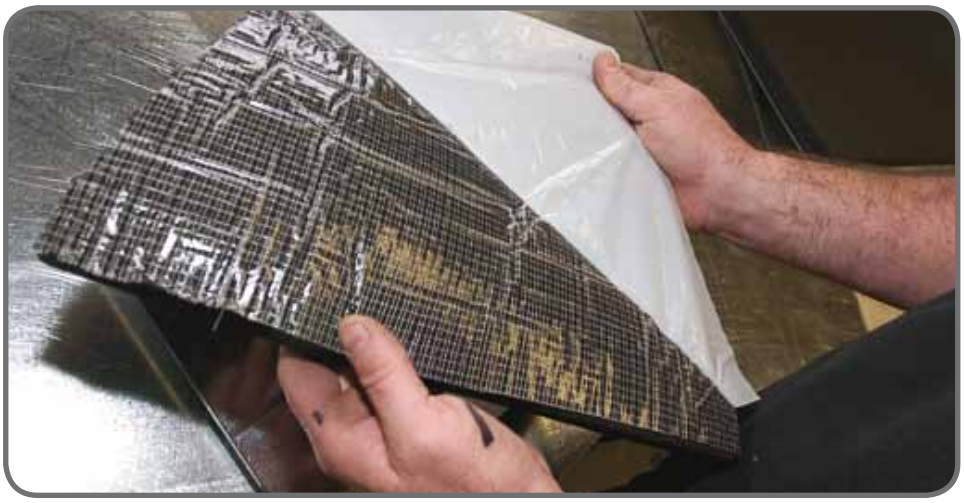
PHYSICAL PROPERTIES	K-FLEX CLAD® TAPE WT	TEST METHODS
Thickness	0.012"	
Reaction to Fire	25/50	ASTM E84
Water Vapor Permeability	0.001 perm-in	ASTM E96
Dimensions	2", 4", 6" or 8" width x 75' length roll 4 rolls per carton	
Weather, UV Resistance	Excellent	ASTM G 53
Corrosion Risk	The system provides protection against corrosion under insulation.	
Salt Spray Resistance	Excellent	BS 903 F12
Wear Resistance	Excellent	BS 903 A2
Ozone Resistance	Excellent	BS 903 A43
Chemical Resistance	Excellent	Acids, Alcohols, Alkalies, Oils
Emissivity	0.80	ASTM C1371
Color	White	

Recommended tape sizes for edges and corners vary depending on thickness of insulation used:

INSULATION THICKNESS	TAPE WIDTH
½"	4"
1"	6"
1-1/2"	8"
2"	8"

K-FLEX DUCT® LINER GRAY

designed for air handling systems



K-FLEX DUCT® LINER GRAY DESIGNED FOR AIR HANDLING SYSTEMS

K-FLEX DUCT® LINER GRAY is a fiber-free, moisture- and mold-resistant duct liner that offers excellent performance properties, including a Noise Reduction Coefficient (NRC) of 0.50 for 1" thickness and GREENGUARD® Certifications for low VOC's and microbial resistance.

K-FLEX DUCT® LINER GRAY meets the 25/50 flame spread and smoke development rating up to 2" thick according to ASTM E-84 standards.

BENEFITS:

- Available in R-8
- Increases the efficiency of HVAC systems
- Safe to install
- Moisture and Mold resistance
- Flexible material for an easy installation
- Reduce Noise

APPLICATIONS:

- Schools
- Hospitals
- Public Buildings
- Clean Rooms/Processing Plants
- Hotels

K-FLEX DUCT® LINER GRAY TECHNICAL INFORMATION

UL 94 (Recognition No. E300774)

UV resistant Refer to K-Flex USA L.L.C. Technical Bulletin (Outdoor Applications) for More Information

FM APPROVED

Made in USA

Contains a Protective Antimicrobial Agent

Silver Associate MEMBER SMACNA

R-8

GREENGUARD Children & Schools Indoor Air Quality Certified

DESCRIPTION

K-FLEX Duct® Liner Gray is a CFC- and HCFC-free, closed cell, flexible elastomeric thermal and acoustical insulation. It is gray in color and supplied in rolls up to 60" wide from 1/2" to 2" thickness*. It is supplied either as S2S (Skin 2 Sides) or with a factory-applied scrim-reinforced acrylic adhesive on the opposite side.**

K-FLEX Duct® Liner Gray 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. K-FLEX Duct® Liner Gray is GREENGUARD® certified as a low VOC material, meeting the requirements for the *"Children & Schools"* and *"Indoor Air Quality"* classifications.

Features of PSA**: tear- and moisture-resistant polyolefin easy release liner; continuous reinforcing scrim that prevents stretching of insulation and improves peel strength.

APPLICATIONS

K-FLEX Duct® Liner Gray is used to retard heat gain / loss and prevent condensation or frost formation on equipment or ducts. K-FLEX Duct® Liner Gray is recommended for applications ranging from -40°F to 200°F (-40°C to 93°C).

K-FLEX Duct® Liner Gray can be used as duct and air handling equipment liner, and is R-8 at 2" thickness. R-values designate the thermal resistance value of a material. K-FLEX Duct® Liner Gray with PSA** reduces installation time and minimizes the amount of solvent-based contact adhesives required, making it ideal for new and retrofit applications. The scrim reinforcement reduces the tendency to stretch the sheet insulation during installation and improves the peel strength of the material.

Thickness recommendations for K-FLEX Duct® Liner Gray have been calculated to control condensation on cold surfaces. *(Refer to the table on the next page for specific recommendations.)*

Ideal Applications include air handling systems in schools, hospitals, hotels, public buildings and clean/processing rooms.

INSTALLATION

K-FLEX Duct® Liner Gray should be applied to clean, dry ductwork and equipment. Adhesive should be applied to all compression joints and used on all butt edges. Apply mechanical fasteners in accordance with *SMACNA guidelines*.

When air stream velocities exceed 4,000 FPM (20.3m/second), metal nosing is recommended to be applied to every leading edge. Nosing may be formed, channeled or zee-attached on duct by screws, rivets or welds.

K-FLEX Duct® Liner Gray is acceptable for use in duct or plenum applications, meeting the requirements of NFPA 90A and 90B.

RESISTANCE TO MOISTURE VAPOR FLOW

The closed cell structure and unique formulation of K-FLEX Duct® Liner Gray effectively retards the flow of moisture vapor, and is considered a low transmittance vapor retarder. For most applications, K-FLEX Duct® Liner Gray needs no additional protection.

** PSA available up to 1-1/2" thickness.*

***All thicknesses are nominal.*

PYHSICAL PROPERTIES		K-FLEX DUCT® LINER GRAY	TEST METHODS
Thermal Conductivity (K) BTU - in/hr - Ft^2 - °F (W/mK)	75°F (24°C) Mean Temp	0.25 (0.036)	ASTM C 177
Density		3-6 PCF	ASTM D 1622/ ASTM D 3575
Operating Temperature Range	Upper Lower	200°F (93°C) -40°F (-40°C)	
Water Vapor Permeability Dry Cup. Perm-In		<0.06	ASTM E 96
Water Absorption %		<0.20	ASTM C 209
Flame Spread (up to 2" wall) (with PSA = 1-1/2" wall)		Not greater than 25	ASTM E 84
Smoke Developed (up to 2" wall) (with PSA = 1-1/2" wall)		Not greater than 50	ASTM E 84
Ozone Resistance		Good[1]	ASTM D 1171
Mold Resistance/Air Erosion		Pass	ASTM C 1338, UL 181/ASTM G21
Color		Gray	
Resistance to oil & greases		Good	
Odor		Negligible	
% closed cells		>90	
Flexibility		Excellent	

1 Where UV sterilizing equipment is used within the air handling system, protect K-FLEX Duct® Liner Gray with K-FLEX® 374 Protective Coating. Refer to K-FLEX® 374 technical data sheet for more information.

PRESSURE SENSITIVE ADHESIVE PROPERTIES (PSA)

Description: Transfer tape designed for high temperatures (250˚F), high performance applications where high tack, comformability, and a thin bond layer are required.

Construction: Adhesive: High coat weight modified crosslinked acrylic typified by a high initial tack, plasticizer resistance and high shear strength, resistant to solvents, chemicals, UV light and moisture.

Liner: PE release liner, (75 microns) moisture and tear resistant, easy release.

SOUND ABSORPTION COEFFICIENTS AT FREQUENCY

ASTM C423 / E795 Type A Mounting/Sabins/Sq. Ft.

THICKNESS	125Hz	250Hz	500Hz	1000Hz	2000Hz	4000Hz	NRC
1/2" (12mm)	0.01	0.03	0.06	0.13	0.33	0.23	0.15
3/4" (19mm)	0.13	0.13	0.80	0.41	0.58	0.57	0.50
1" (25mm)	0.12	0.25	0.97	0.32	0.52	0.48	0.50

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
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
Normal Conditions (Max 85°F, 29°C - 70% R.H.)	1/2"	13 mm	3/4"	19 mm	1"	25 mm	1-1/4"	32 mm
Severe Conditions (Max 90°F, 32°C - 80% R.H.)	3/4"	19 mm	1"	25 mm	1-3/4"	44 mm	2"	51 mm

**K-FLEX Duct® Liner Gray in thickness noted within the specified temperature ranges will prevent condensation under design conditions defined below. K-FLEX Duct® Liner Gray is not available in all thicknesses listed.*
***Mild:** Typical conditions are most air-conditioned spaces and arid climates.*
***Normal:** Maximum severity of indoor conditions rarely exceed 85°F (29°C) and 70% R.H. in United States.*
***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 (0.25 plus 3% test error allowance)*

SHEET "R" VALUES

R Value 1/2"	R Value 3/4"	R Value 1"	R Value 1-1/2"	R Value 2"
2.0	3.0	4.2	6.0	8.0

All sizes are nominal.
***Note:**"R" values 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 thickness in each case. Lower operating temperatures will result in improved R values. Contact Technical Services for specific recommendations.*

SPECIFICATION COMPLIANCE

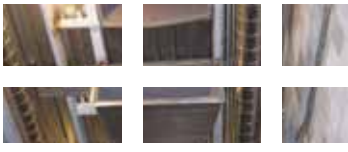
- ASTM C534 Type 2 (Sheet), Grade 1
- ASTM C1534
- ASTM D1056-00-2B1
- ASTM C423/E795 NRC=0.50 at 1" thickness
- New York City MEA 186-86-M Vol. V
- USDA Compliant
- RoHS Compliant
- UL 94-5V Flammability Classification (Recognition No. E300774)
- ASTM E84: 25/50 at 2" and below
- Meets requirements of NFPA 90A Sect. 2.3.3 for Supplementary Materials for Air Distribution Systems up to 2" thickness
- Meets requirements of UL 181 Sections 11.0 and 16.0 (Mold Growth/Air Erosion)
- Meets requirements of ASTM C411 (Test Method for Hot Surface Performance of High Temperature Thermal Insulation)
- GREENGUARD certified under the "Children & Schools" and "Indoor Air Quality" classifications
- Meets energy code requirements for ASHRAE 90.1 and 189.1

K-FLEX DUCT® LINER GRAY

Insulation designed WITH THE contractor in mind

K-FLEX DUCT® LINER GRAY is my preferred choice for cost-effective and safe fabrications. Its flexibility and pre-applied adhesive liner saves time and money on labor. Plus, it is fiber-free and resistant to moisture and mold, so I know I am contributing to safe breathing environments and energy-efficient HVAC systems.

Contact K-FLEX USA today for more information and/or to receive free samples.



K-FLEX ECO™

a halogen-free insulation

K-FLEX ECO™ A HALOGEN-FREE ALTERNATIVE

BENEFITS:

- Halogen-Free Formula, does not contribute to stress crack corrosion on stainless steel
- High temperature range -297°F to 300°F
- Moisture Vapor Resistance

APPLICATIONS:

- Shipbuilding/Railways
- Refrigeration
- Industrial Processes up to 300°F

K-FLEX ECO™ IS FLEXIBLE, CLOSED CELL, HALOGEN-FREE INSULATION with a distinctive green color for easy identification. Environmentally-friendly, K-FLEX ECO products are offered in sheet/roll and tube form. Sheets/rolls are available with PSA (Pressure Sensitive Adhesive) for easy and efficient installation. The PSA offering ensures a tight bond without the use of contact adhesives.

K-FLEX ECO™ is ideal for marine applications ranging from naval surface vessels and submarines to offshore oil platforms as it complies with several marine requirements.

K-FLEX ECO™ TECHNICAL INFORMATION

UL 94
(Recognition No. E300774)

UV resistant Refer to K-Flex USA L.L.C. Technical Bulletin (Outdoor Applications) for More Information

Made in USA

DESCRIPTION

K-FLEX ECO™ is a halogen-free, closed cell elastomeric insulation. It is green in color and is available in tube and sheet form. Tube sizes range from 3/8" inside diameter to 8" IPS, in 1/2", 3/4" and 1" wall thickness. Sheets and rolls are available in 1/2", 3/4" and 1" thickness (1-1/2" skin-2-side). K-FLEX ECO™ does not contain carbon black in accordance with *United States Navy Environmental Department* standards. Additionally, K-FLEX ECO™ does not contain fibers, PVC, or CFCs.

APPLICATIONS

K-FLEX ECO™ was developed for applications where corrosive smoke and environmental issues (toxicity) are critical. It is suitable for piping, vessels, and duct work on United States Naval Ships, the general maritime industry, and other industrial applications. K-FLEX ECO™ is certified to *Electric Boat Corporation Specification EB 4013* and meets the requirements specified by the International Maritime Organization per the *SOLAS Agreement*.

K-FLEX ECO™ is used to insulate hot piping up to 300°F (1" thickness minimum). It can be used as an alternative to low-temperature fiberglass, calcium silicate and polyimide insulation. K-FLEX ECO™ can be used on 50 lb. steam lines with design temperatures up to 300°F (1" thickness minimum). Used under these conditions a comparable thin layer of discolored hardened material in the inner wall will form. This constitutes a normal reaction and does not in any way adversely affect the insulation properties of the foam.

K-FLEX ECO™ is also used on cruise ships and other commercial vessels. It is suitable for use in industrial and commercial areas as well, including clean rooms and food / beverage manufacturing facilities where a fiber-free environment is specified.

K-FLEX ECO™ is well-suited for stainless steel applications since it does not contain halogens that are known to contribute to corrosion problems.

INSTALLATION

K-FLEX ECO™ is applied following the guidelines used for all K-FLEX USA elastomeric insulation products. Tubing slides easily over piping, or for existing lines, tubing is slit lengthwise and sealed into place. All seams and joints should be sealed with an approved contact adhesive. K-FLEX® 720 LVOC Contact Adhesive is a halogen-free contact adhesive suitable for use with K-FLEX ECO™.

When K-FLEX ECO™ is applied to vessels and duct work, use 100% coverage of an approved 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. For detailed installation procedures, reference the *K-FLEX USA Insulation Installation Guide*.

RESISTANCE TO MOISTURE VAPOR FLOW

The closed cell structure and unique formulation of K-FLEX ECO™ effectively retards the flow of moisture vapor, and is considered a diffusion resistant insulation. For most applications, K-FLEX ECO™ requires no additional protection. Additional vapor barrier protection may be necessary for K-FLEX ECO™ when installed on low temperature surfaces in combination with continuous high humidity conditions.

PHYSICAL PROPERTIES			
PROPERTIES		**K-FLEX ECO™**	**TEST METHODS**
Thermal Conductivity (K) BTU/hr/sq ft/°F/in (w/mk)	90°F (32°C) Mean Temp 75°F (24°C) Mean Temp 50°F (10°C) Mean Temp	0.282 (.041) 0.270 (.039) 0.263 (.038)	ASTM C-177 ASTM C-177 ASTM C-177
Operating Temperature Range	Upper (1" thickness minimum) Lower	300°F* (200°F with Seam-Seal) -297°F (-70°F with Seam-Seal)	
Density		4.5 lbs/cu. Ft.	ASTM D-1056
Optical Smoke Density		<150	ASTM E-662
Water Vapor Permeability		Excellent (0.03 perm/in)	ASTM E-96
Toxicity		Halogen/Dioxin/CFC Free	EB 4013
Flexibility		Excellent	EB 4013
Meets IMO (International Maritime Organization) SOLAS Agreement		Yes	MSC 61 (67), A 653
ABS (American Bureau of Shipping) and Lloyd's Certified		Yes	SOLAS Agreement (IMO)
Flame and Smoke		Meets U.S. Navy Standard for Shipboard	EB 4013
*Operating Temperature		Approved by US Navy (BBN) for up to 50 lbs. steam use	

SPECIFICATION COMPLIANCE

- ASTM C534 Type 1 (Tubing), Grade 3
- ASTM C534 Type 2 (Sheet), Grade 3
  US Navy EB4013
- IMO SOLAS Agreement
- ABS & Lloyd's Certified
- ASTM E84 25/50-rated flame/smoke rated up to 3/8" wall thickness
- UL 94-5VA Flammability Classification (Recognition No. E300774)

K-FLEX® ELASTOMERIC FOAM TAPE - ECO TECHNICAL INFORMATION

Made in USA

DESCRIPTION

K-FLEX® Elastomeric Foam Tape - ECO is an effective, halogen-free alternative to tubing insulation in tight areas where traditional insulation will not suffice. It is a specially designed flexible, elastomeric insulation product.

It is manufactured in 1/8" thickness by 2" width by 30' length, with pressure sensitive adhesive for applying to hot or cold pipes and fittings. The factory-applied pressure-sensitive acrylic adhesive adheres firmly and forms a long-lasting bond, while the closed cell structure of the product provides good thermal and low moisture permeability properties.

USES

K-FLEX® Elastomeric Foam Tape - ECO is used to retard heat gain and prevent condensation or frost formation on cold water plumbing, chilled water, and refrigeration lines. It also reduces heat flow for hot water plumbing, liquid heating, and dual temperature piping. K-FLEX® Elastomeric Foam Tape - ECO is ideal for insulating short runs of pipes or valves and fittings where it is impractical to install tubing insulation. The tape can be applied in multiple wraps (thickness) to meet various service conditions. As a halogen-free product, it is suitable for stainless steel applications.

APPLICATION INSTRUCTIONS

K-FLEX® Elastomeric Foam Tape - ECO may be applied to all diameter pipes and tubes by spiral winding. Remove the release paper as the tape is spiral-wrapped around the pipe. Avoid stretching. Edges may be butted or overlapped. The seams are sealed with slight hand pressure. Surfaces to which K-FLEX® Elastomeric Foam Tape - ECO is to be applied must be dry and clean. For best results, apply at temperature above 40°F (4°C) and not on heated surfaces.

SPECIFICATIONS

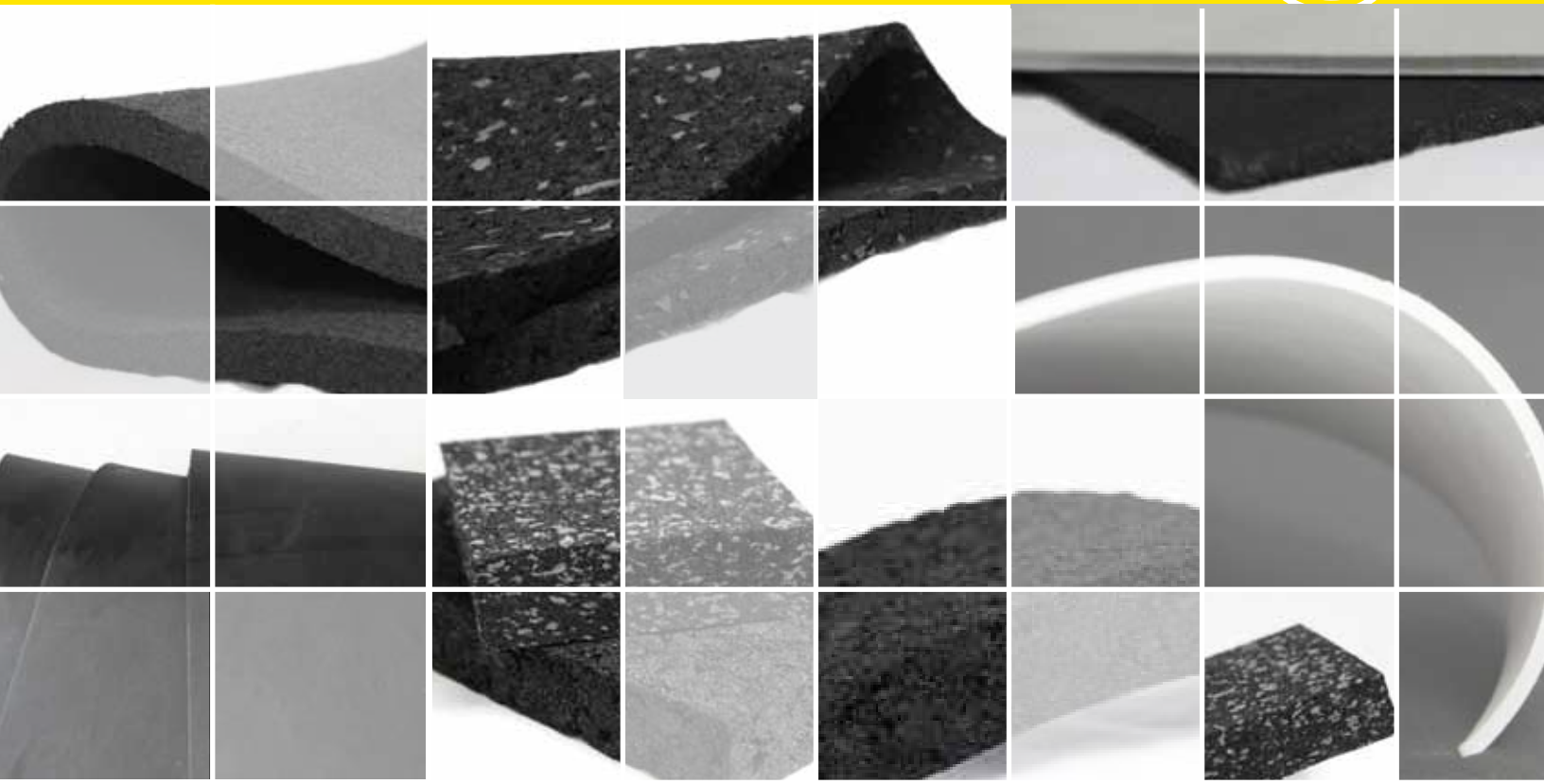
K-FLEX® Elastomeric Foam Tape - ECO is manufactured using K-FLEX ECO™ elastomeric sheet insulation and provides the same great moisture-resistant and thermal properties and protection for higher temperature range applications.

PHYSICAL PROPERTIES	
Skin Surface	Smooth, green surface for excellent appearance
Composition	Flexible, halogen-free, closed cell elastomeric insulation
Color	Green
Dimensions	1/8" (3 mm) x 2" (50 mm) x 30' (9.1 m) roll 12 rolls per master carton
Density	4-8 lb/cu. ft.
Thermal Conductivity	.25 at 75°F, tested according to ASTM C-177
Water Absorption	0.10 lbs./cut surface area, ASTM 1667
Water Vapor Permeability	0.10 perms-in (dry cup) ASTM E96
Flammability Characteristics	ASTM E 84 25/50 Rated
Temperature Limits	-40°F (-40°C) to 200°F (93°C)
Freight Classification	Tape, insulation, NOIBN. No label required

THICKNESS RECOMMENDATIONS - TO CONTROL CONDENSATION		
Air Temperature and Relative Humidity	**Pipe Temp**	
	50°F (10°C)	32°F (0°C)
77°F (25°C)/50% RH	Single Layer	2 Layers
85°F (29°C)/70% RH	3 Layers	4 Layers

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


K-FLEX ECO
K-FLEX ECO
K-FLEX ECO



K-FONIK™

materials for noise reduction and isolation

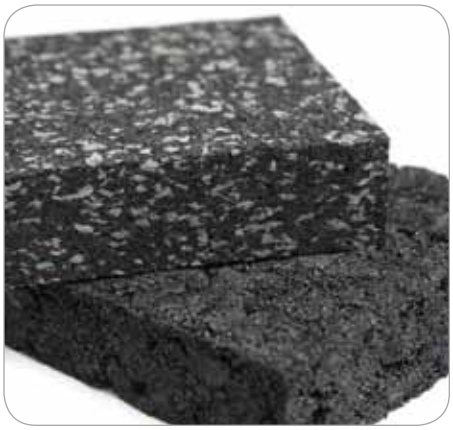
K-FONIK™ SOUND INSULATION

INSULATION FOR OPTIMUM LISTENING ENVIRONMENTS

K-FONIK™ acoustic insulation products are designed to control airborne and structure-borne noise from mechanical systems, air ducts, HVAC rooftop systems, appliances, machinery, transportation vehicles, floors, ceilings and walls, among others.

Available as high mass noise barriers (GK, GV) and sound absorbers (AB 10, AB 15), K-FONIK™ products address unwanted noise at its source, path and receiver.

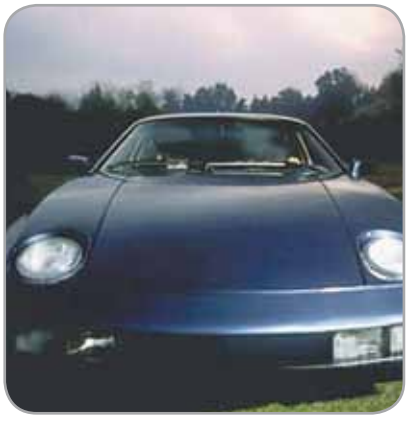
With sound quality playing a key role in creating environments that promote a high level of performance and comfort, K-FONIK™ products deliver a long-lasting solution for noise reduction and isolation.



K-FONIK™ AB (10, 15).

K-FONIK™ GK.

K-FONIK™ GV.



SOUND TRANSMISSION CLASS (STC)

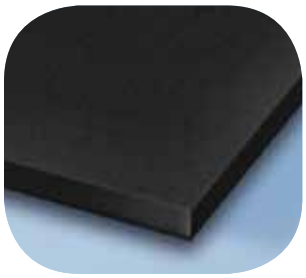
Sound Transmission Class is a measure of how well a material or an assembly can block sound. Specifically, STC is calculated from sound attenuation (Sound Transmission Loss) values tested at 18 standard frequencies from 100 Hz to 5000 Hz. These values are plotted as a curve on a sound pressure level graph and are compared to a standard reference contour. Acoustical engineers fit the values to the appropriate Transmission Loss curve to determine an STC rating. STC is roughly noise reduction measured in decibels that a material can provide.

K-FONIK™ APPLICATION GROUPS

NOISE BARRIER MATERIALS

Noise barriers reduce structure-borne noise generated by a vibrating surface and airborne noise when placed between a sound source and its receiver.

K-FONIK™ GK, K-FONIK™ GV



K-FONIK™ GK

K-FONIK™ GV

SOUND ABSORPTION MATERIALS

Absorbing materials reduce sound reflection and transfer by converting sound energy into heat.

K-FONIK™ AB OPEN CELL 10-15

K-FONIK™ AB 10

K-FONIK™ AB 15

MARKETS: GUIDE TO PRODUCTS & APPLICATIONS

WORK SECTOR	APPLICATIONS	K-FONIK™ AB 10 - 15	K-FONIK™ GK - GV*
BUILDING	Perimeter walls, Dividing walls, Floor and Ceiling, Plumbing and draining system	●	●
HVAC	Piping	●	●
INDUSTRIAL and OIL & GAS	Piping, equipment and plants	●	●
O.E.M.	Machine covers, Engine compartments, Household Appliances	●	●
CONSTRUCTION & MASS TRANSIT	Engine and frames, Partitions, Technical installations		●
AUTOMOTIVE	Engine noise insulation and frames, Sound absorption for roof frames, Driver cabins.		●

* **K-FONIK™ GV** viscoelastic mass with special certifications for construction and mass transit industry.

K-FONIK™ AB TECHNICAL INFORMATION

Made in USA

DESCRIPTION

K-FONIK™ AB is an environmentally-friendly, CFC-free, flexible, open cell sheet product used for acoustic damping, gasketing and thermal insulation. It is comprised of recycled, closed cell foam that is bonded together with a urethane adhesive. The combination of closed cell material (with a controlled particle size and particle size distribution) re-engineered to produce an open cell structure results in a unique set of properties that readily accept and dissipate sound waves, ensuring maximum acoustical absorption.

The product is predominantly black in color and comes in sheets 39" x 39" in thicknesses of 1/2", 1", 1-1/2", and 2", as well as in bun form. The product is offered in two densities: 10 pcf and 15 pcf. It has a temperature range of -40°F to +200°F.

APPLICATIONS

K-FONIK™ AB offers excellent acoustic performance (NRC = 0.75 at 1" thickness for 15 when tested to ASTM C423) and thermal properties (k = 0.30 Btu in/hr-ft2- F). Sound absorbing materials reduce sound reflection and transfer by converting sound energy into heat.

Equipment Rooms:
A) Acoustic blankets – Filled with K-FONIK™ AB to absorb noise (as a replacement for glass wool or rock wool), and to resist compression and moisture.
B) Interior Surfaces – To reduce noise from transferring through walls, ceilings and floors, creating soundproof spaces.

Machine Covers:
To reduce noise and vibration.

Piping:
K-FONIK AB™ is used in conjunction with high mass products to reduce transmission noise on large pipes in industrial applications.

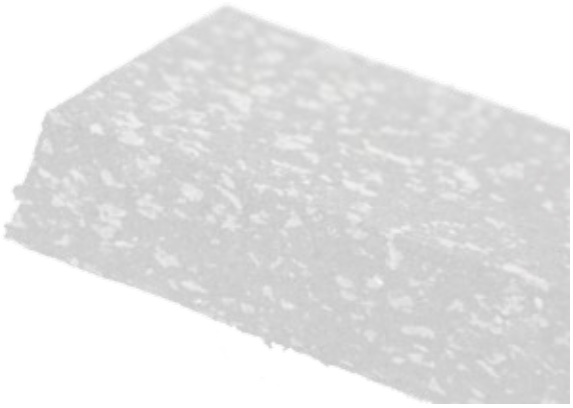
Floor underlayment:
To reduce and isolate foot fall or impact noise between the floor/ceiling assembly.

INSTALLATION

K-FONIK™ AB is supplied in flexible sheets in a variety of thicknesses. It is easily cut and fabricated. K-FONIK™ AB can be adhered to most non-porous substrates using K-FLEX® 620 Contact Adhesive.

RECYCLED CONTENT

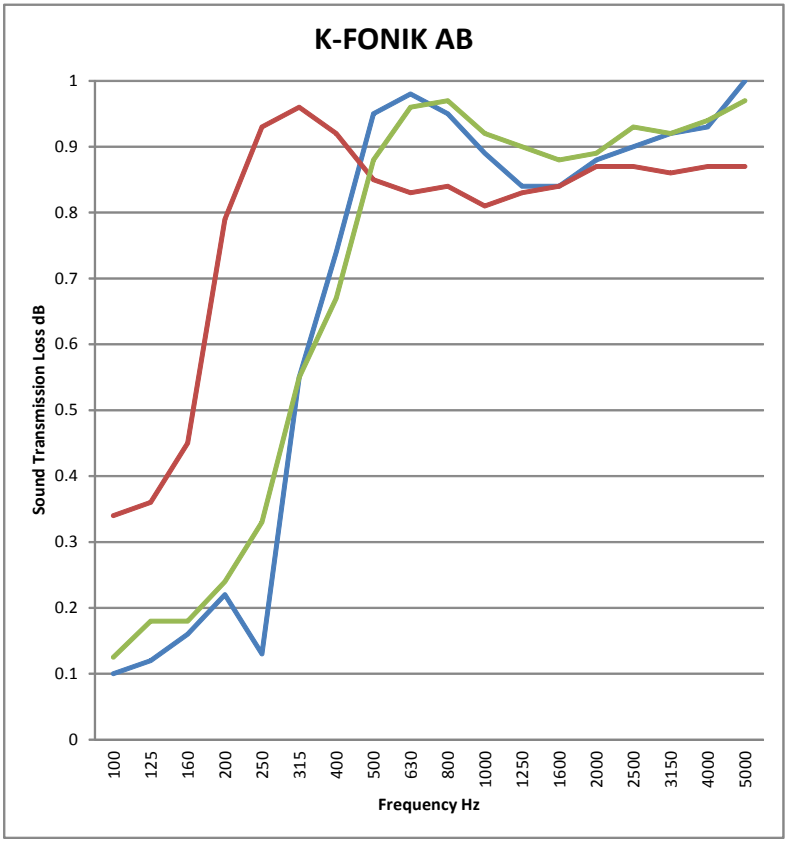
K-FONIK™ AB is manufactured from 90% recycled product and reduces material use. K-FONIK™ AB qualifies to classifed as a green product by the *National Green Building Products Council*.



K-FONIK™ AB ACOUSTIC PERFORMANCE

NOISE REDUCTION COEFFICIENT (NRC)

K-FONIK™ AB 10, 1": NRC = 0.75
K-FONIK™ AB 10, 2": NRC = 0.85
K-FONIK™ AB 15, 1": NRC = 0.75



PHYSICAL PROPERTIES

ATTRIBUTES	K-FONIK™ AB 10	K-FONIK™ AB 15
Material Type	Open Cell, Re-Engineered	Open Cell, Re-Engineered
Color	Black	Black
Density (kg/m^3) Range/max/min?	160 (10 pcf)	240 (15 pcf)
Tensile (psi) minimum	7	10
Elongation (%) minimum	25	25
Thermal Conductivity (k-value Btu (in/hr-ft^2-°F))	0.30	0.30
Thicknesses (in)	1/2, 1, 1-1/2, 2, bun form	1/2, 1, 1-1/2, 2, bun form

K-FONIK™ GK/GV TECHNICAL INFORMATION

Made in USA

DESCRIPTION

K-FONIK™ GK and GV high mass noise barriers are flexible, non-reinforced, resilient mass loaded elastomeric materials that block the transmission of airborne noise from one area to another. K-FONIK™ high mass products are ideal for direct application to the noise source and/or to the housing covering the noise source. The product comes in black (GK) and gray (GV), and is stocked in rolls (10' or 25' length x 48" width) of densities: 1.0 and 1.5 lb/sq ft. The product has a temperature range of -297°F to +240°F.

The reduction of airborne noise and mass properties exhibited by K-FONIK™ high mass products are attained without the use of hazardous lead or heavy metals. K-FONIK™ high mass products are made with fire-resistant mineral fillers.

K-FONIK™ GV has been tested to the following flammability test methods: IMO A653 (CE Marine), ASTM E84, E162, and E662.

APPLICATIONS

K-FONIK™ high mass products offer excellent acoustic performance (STC = 26 dB at 1.0 lb/sq ft). Sound barrier materials reduce structure-borne noise generated by a vibrating surface and airborne noise when placed between a sound source and its receiver.

The vibration of metal panels, housings and enclosures is a common source of high intensity noise.

The reduction of resonant vibrational energy and noise can efficiently and economically be achieved by use of K-FONIK™ high mass products, which convert vibrational energy to heat energy, resulting in the following benefits: reduction of vibration transfer to adjoined surfaces, increased working life of the metal, and the ability to use thinner metal without the need for ribs, shaping, or other complications.

Equipment and Engine Rooms:
A) Free-hanging soundproof acoustical curtain panel
B) Interior surfaces – To reduce noise from transferring through walls, ceilings and floors.

Machine Covers:
Wrapped to reduce noise and vibration.

Piping:
To reduce transmission noise on process and drain piping in industrial applications.

General Construction:
Floors and piping
Mass Transit / Shipbuilding:
Floors and Engine Rooms

INSTALLATION

K-FONIK™ GK and GV are supplied in flexible rolls in several densities. It is easily cut and fabricated.

K-FONIK™ GK and GV can be adhered to most non-porous substrates using K-FLEX® 620 Contact Adhesive.

FLAME AND SMOKE RATING

K-FONIK™ GVS in 1.5 lb/sq ft mass has a flame spread rating of 25 or less and a smoke development rating of 50 or less as tested by ASTM E84, *"Surface Burning Characteristics of Building Materials".*

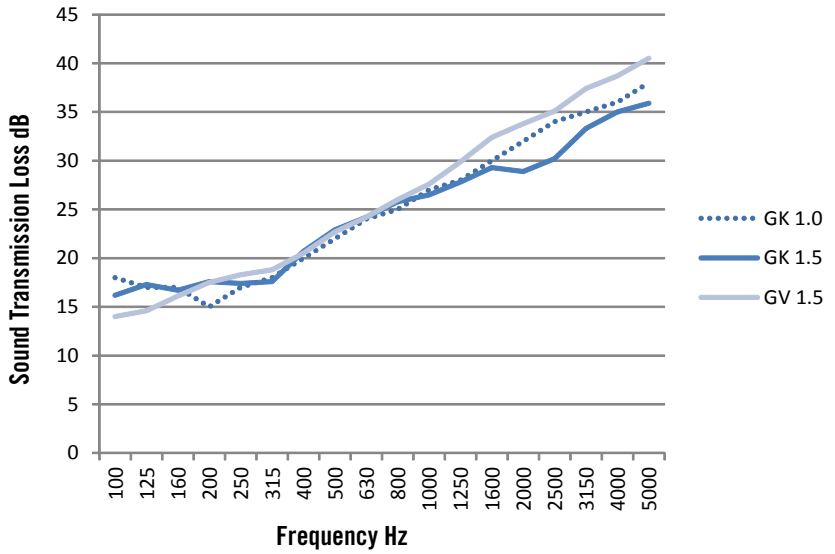
SPECIFICATION COMPLIANCE

GV:
- FMVSS 302 - Pass
- ASTM E84 - 25/50 (Flame / Smoke rating)
- ASTM E162 - 25 max
- ASTM E662 - 100 max

GK:
- ASTM E84 - 25/50 (Flame / Smoke rating)
- FMVSS 302 - Pass

K-FONIK™ GK/GV ACOUSTIC PERFORMANCE

	GK		GV
FREQ. Hz	1.0 TL dB	1.5 TL dB	1.5 TL dB
100	18	16	14
125	17	17	15
160	17	17	16
200	15	18	18
250	17	17	18
315	18	18	19
400	20	21	21
500	22	23	23
630	24	24	24
800	25	26	26
1000	27	27	28
1250	28	28	30
1600	30	29	32
2000	32	29	34
2500	34	30	35
3150	35	33	37
4000	36	35	39
5000	38	36	41



PHYSICAL PROPERTIES	K-FONIK™ GK	K-FONIK™ GV
Material Type	High-Mass elastomeric material	High-Mass elastomeric material
Color	Black	Gray
Specific Gravity (min)	2.0	2.0
Tensile (psi) (min)	300	300
Elongation (%) (min)	25	10
Tear Die C (lbs) (min)	50	50
Thermal Conductivity (k-value Btu (in/hr-ft^2-°F))	0.16	0.16
Temperature Resistance	-297°F to 240°F	-297°F to 240°F
Surface Finish	Smooth	Smooth
Thicknesses (in)	0.12, 0.16	0.12, 0.16
Mass (lb/sqft)	1.0, 1.5	1.0, 1.5
STC (1.5 lb/ sq ft)	21 (0.5 lb/sq ft) 25 (0.75 lb/sq ft) 26 (1.0 lb/ sq ft); 26 (1.5 lb/ sq ft)	27 (1.5 lb/ sq ft)
Fire Classification	FMVSS 302	ASTM E-84: 25/50 max, ASTM E-162: 25 max, ASTM E-662: 100 max, FMVSS 302

TECHNICAL BULLETINS

K-FLEX USA offers technical expertise related to the application and specification of elastomeric insulation. Below is a listing of technical resources that are available for download at ***www.kflexusa.com.***

APPLICATION BULLETINS

TA1	Installation Tool Source Guide
TA2	Installation Techniques
TA3	Insulating 90° Bends & P-Traps
TA4	K-FLEX Duct® Liner Gray for Duct & AHU Applications
TA5	Elastomeric Insulation Products on Stainless Steel
TA6	Insulation Products for Freeze Prevention
TA7	Coating and Jacketing Recommendations
TA8	High Temperature Use Limit for Elastomeric Insulations
TA9	Commercial Spray Paint for UV Protection
TA10	Underground Applications / Direct Burial
TA11	Pipe Hangers
TA12	Shelf Life of Insulation Products and Accessories
TA13	Insulation Tapes
TA14	Adhesive Recommendations
TA17	Insulation I.D.'s and Fit
TA18	Adhering Flexible Closed Cell Insulation to Rigid Cellular Glass Insulation
TA19	Determining Acceptable Air Flow Rate in a Plenum
TA20	Cold Weather Installation
TA21	Air Duct Cleaning
TA22	Outdoor Applications
TA24	Use of Heat Tapes/Trace Systems
TA25	Effects of Skin vs. no Skin Sheet on Adhesion
TA27	Comparison of Elastomeric vs. Fiberous Insulation
TA28	Insulating Large Diameter Pipe
TA29	K-FLEX Clad® AL Sheet and Roll Installation
TA30	Comparison of Elastomeric vs. Mineral Wool Insulation
TA31	Comparison of Elastomeric vs. Polystyrene Insulation
TA32	Comparison of Elastomeric vs. Polyisocyanurate Insulation
TA33	Comparison of Elastomeric vs. Foam Glass Insulation
TA34	Firestopping
TA37	Effects of Operating Temp on Elastomeric Insulation
TA38	Cotton Fiber Duct Liners
TA39	Greenguard and Indoor Air Quality
TA40	LEED Certification
TA42	Restriction of Hazardous Substances (RoHS)
TA43	Actual O D's of Piping
TA44	UV Sterilization Systems
TA45	PEX Tubing
TA46	Surface Preparation When Using Sheet with PSA
TA47	Press-On Fittings and Insulation Sizing
TA48	Chemical Resistance
TA50	Insulating Round/Oval Duct
TA51	Mold Resistance of K-FLEX Duct® Liner Gray
TA51A	Mold Resistance of K-FLEX Elastomeric Insulation Products
TA52	K-FLEX Duct® Liner Gray vs. Fiberglass Comparison
TA53	Mechanical Attachment of K-FLEX Duct® Liner Gray
TA54	Effect of Moisture on Insulation Performance
TA55	Insulating Large Diameter Pipes with Pre-formed insulation
TA57	Cutting K-FLEX Duct® Liner Gray
TA60	CA Title 24 – 2005 Building Energy Efficiency Standards for Residential & Nonresidential Buildings
TA61	K-FLEX ECO™ Adhesive Recommendation
TA62	K-FLEX ECO™ High Temperature Applications
TA63	Protecting Thermal Insulation Outdoors
TA64	K-FLEX® 320 Contact Adhesive Field Strength
TA66	Acoustic Insulation Applications
TA67	NBR vs. EPDM
TA68	Brominated Flame Retardants
TA69	Friction Loss for Elastomeric Duct Liner
TA70	Key K-FLEX USA Contact Adhesive Properties
TA71	Duct Liner Acoustic Properties

SPECIFICATION BULLETINS			
TS1	Standard Specifications ASTM C-534 (Elastomeric)	TS14	ASHRAE 62
TS2	General Description of Key Physical Properties as Described in ASTM C534	TS15	Underwriters Laboratories Inc. (ULI) Listed Products
TS3	MIL P 15280J / EB 4013 (Insulation Products)	TS16	Flame Spread/Smoke Developed Values – ASTM E84
TS4	Fire Performance Test Methods (Summary)	TS17	Clean Room Acceptability
TS5	National Fire Protection Association (NFPA)	TS18	General Description of Key Physical Properties as Described in ASTM C1534 Duct Liner
TS6	USDA, FDA, NSF Regulations Affecting the Use of Insulation Products	TS20	The Construction Specifications Institute MASTERFORMAT 2004 EDITION
TS7	Product Content / Formulation	TS21	Molded PVC Fitting correlation chart
TS8	Third Party Supervision of Elastomeric Insulation Products (Factory Mutual Research Corp – FMC)	TS22	CPVC Piping
TS10	Polymer Comparisons (NBR /PVC vs. EPDM)	TS23	NSF Approval
TS11	R-Values for Elastomeric Tubular Products	TS24	Specification Guide_HVACR
TS12	Effect of Mean Temperature on k-Factors	TS25	Specification Guide_Commerical-Industrial
TS13	Calculation of k-Factor and R-Value		
MATERIAL SAFETY DATA SHEETS			
MSDS01	K-FLEX® 720 LVOC Contact Adhesive	MSDS10	K-FLEX Clad® AL
MSDS02	K-FLEX® 620 Contact Adhesive	MSDS11	K-FLEX Clad® WT
MSDS04	K-FLEX® 373 Contact Adhesive	MSDS12	K-FLEX Clad® IN
MSDS05	K-FLEX® 320 Contact Adhesive	MSDS13	K-FLEX Solar™
MSDS06	K-FLEX® Cork Tape	MSDS14	K-TEK™
MSDS07	K-FLEX ECO™	MSDSELAST	K-FLEX® Elastomeric Foam
MSDS09	K-FLEX® PSA Scrim		

NOTES