

HVAC Submittals

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HVAC Submittal Index

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23_07_00

HVAC Insulation

AP/Armaflex® Black LapSeal™

Tube Insulation with
Reinforced Lap Seal

Fiber Free

The original flexible elastomeric pipe insulation with a new and improved lap seal for greater seam security and increased protection against condensation, mold and energy loss.



- Angled cut with more surface area for a better bond
- A single interior adhesive liner for quicker application
- New durable, low-profile lap seal with wider release tab, stays closed and looks neat
- Easy to install – an excellent choice for retrofit applications
- 25/50 rated for use in air plenums
- Fiber-free, formaldehyde-free, low VOC and non-particulating formulation protects indoor air quality
- Microban® antimicrobial product protection inhibits the growth of mold and mildew in the insulation

GREENGUARD Certified products are certified to GREENGUARD standards for low chemical emissions into indoor air during product usage. For more information, visit ul.com/gg.





Microban antimicrobial product protection is limited to the product itself and is not designed to protect the users of these products from disease causing microorganisms, or as a substitute for normal cleaning and hygiene practices. *

Technical Data: AP Armaflex® Black LapSeal™ Tube Insulation

Description:

Black flexible closed-cell elastomeric thermal insulation in tubular form with a self-seal system reinforced with lap seal tape

Applications:

Insulation for piping associated with HVAC, VRV and VRF systems, chillers, hot and cold water, refrigeration

Specifications Compliance:

ASTM C 534, Type I – Grade 1
ASTM E 84
NFPA 255

UL 723
NFPA 90A, 90B
UL 181

ASTM G-21/C1338
ASTM G-22
ASTM D 1056, 2B1

Approvals, Certifications, Compliances:

- Key physical properties are approved by Factory Mutual.
- GREENGUARD Gold Certified.
- Manufactured without CFCs, HFCs, HCFCs, PBDEs, or Formaldehyde.
- Made with EPA registered Microban® antimicrobial product protection..
- All Armacell facilities in North America are ISO 9001:2008 certified.

Typical Properties

Specifications:	Values:		Test Method:
	3/8" through 1" Walls	1-1/2" and 2" Walls	
Thermal Conductivity: Btu • in./h • ft ² • °F (W/mK)			
75°F Mean Temperature (24°C)	0.245 (0.0353)	0.28 (0.040)	ASTM C 177 or C 518
90°F Mean Temperature (32°C)	0.254 (0.0366)	0.286 (0.041)	
Water Vapor Permeability: Perm-in. [Kg/(s • m • Pa)]	0.05 (0.725 x 10 ⁻¹³)	0.08 (1.16 x 10 ⁻¹³)	ASTM E 96, Procedure A
Flame Spread and Smoke Developed Index:	25/50 rated	25/50 rated	ASTM E 84
Water Absorption, % by Volume:	0.2%	0.2%	ASTM C 209
Mold Growth:	Passed	Passed	UL181
Fungi Resistance:			ASTM G21/C1338
Bacterial Resistance:			ASTM G22
Upper Use Limit:	220°F (105°C)	220°F (105°C)	ASTM C534
Lower Use Limit: ¹	-297°F (-183°C) ²	-297°F (-183°C) ²	ASTM C534
Ozone Resistance:	GOOD	GOOD	Ozone Chamber Test

Sizes:

Wall Thickness (nominal) Form	3/8", 1/2", 3/4", 1", 1-1/2", 2" (10 mm, 13 mm, 19 mm, 25 mm, 38 mm, 50 mm)
Inside Diameter, Tubular Form	3/8" ID to 6" (10 mm to 153 mm)
Length of Sections, Tubular Form	6' (1.8m)

Outdoor Use

Painting with WB Finish or other protective jacketing is required to prevent damage to the insulation in exterior applications and to comply with the insulation protection sections of the International Energy Conservation Code (IECC) and ASHRAE 90.1.

¹ At temperatures below -20°F (-29°C), elastomeric insulation starts to become less flexible. However, this characteristic does not affect thermal efficiency and resistance to water vapor permeability of Armaflex insulation.

² For applications of -40°F to -297°F (-40°C to -183°C), contact Armacell.

ARMACELL LLC
TEL: 800.866.5638
FAX: 919.304.3847

info.us@armacell.com
www.armacell.us
7600 Oakwood Street Extension, Mebane, NC 27302



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Venture Tape™ Line Set Tape 1507 & Venture Tape™ Reflective Insulation Seaming Tape 1507

Technical Data

April, 2015

Product Description 3M™ Venture Tape™ Line Set Tape 1507 and 3M™ Venture Tape™ Reflective Insulation Seaming Tape 1507 are a bi-axially oriented polypropylene (BOPP) tape coated with a cold weather solvent acrylic adhesive.

Product Construction	Backing	Adhesive	Color	Standard Roll Length
	Polypropylene (BOPP)	Acrylic	Line Set Tape available in White, Black, Silver. Reflective Insulation Seaming Tape available in Silver.	60 yds (55 m)

- Features**
- Excels in demanding temperature and humidity applications
 - Applies easily at cold temperatures

Typical Physical Properties **Note: The following technical information and data should be considered representative or typical only and should not be used for specification purposes.**

Test	Typical Value	Typical Value (Metric)	Test Method
Product Thickness	3.0 mils	0.08 mm	PSTC-133
Peel Adhesion	30 oz/in	8.3 N/25 mm	PSTC-101
Shear Adhesion	>24 hrs @ 2.2 psi	>24 hrs @ 15.2 kPa	PSTC-107
Tensile Strength	20 lb/in	90.4 N/25 mm	PSTC-131
Elongation	130%	130%	PSTC-131
Service Temperature	-40° to 185°F	-40° to 85°C	

- Application Ideas**
- Ideal for sealing reflective insulation, flexible air duct and air connectors

3M™ Venture Tape™ Line Set Tape 1507 & 3M™ Venture Tape™ Reflective Insulation Seaming Tape 1507

Storage Store in a clean, dry place. Temperature of 40-80°F (4-26°C) and 40 to 50% relative humidity are recommended.

Shelf Life To obtain best performance, use this product within 12 months from date of manufacture

Technical Information The technical information, recommendations and other statements contained in this document are based upon tests or experience that 3M believes are reliable, but the accuracy or completeness of such information is not guaranteed.

Product Use Many factors beyond 3M's control and uniquely within user's knowledge and control can affect the use and performance of a 3M product in a particular application. Given the variety of factors that can affect the use and performance of a 3M product, user is solely responsible for evaluating the 3M product and determining whether it is fit for a particular purpose and suitable for user's method of application.

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ISO 9001

This Industrial Adhesives and Tapes Division product was manufactured under a 3M quality system registered to ISO 9001 standards.



Industrial Adhesives and Tapes Division

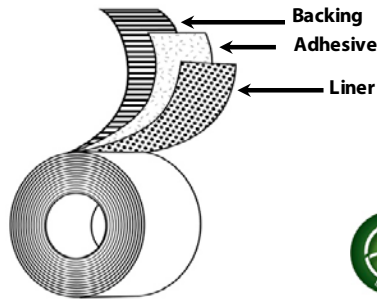
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100% post-consumer

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Insulation Jacketing Tape



Backing: Foil/Scrim/Kraft Paper Laminate
Adhesive: Synthetic Rubber
Liner: Unbleached Natural Kraft Paper
Colors: Aluminum

Specifications: Tested in accordance with UL723
Standard Sizes: 72mm x 46M

Applications

- Vapor barrier seal for insulation facing
- Sealing insulation and repairing in cooler/refrigeration applications

Features

- Foil/Scrim/Kraft Laminate Backing
- Synthetic Rubber Adhesive
- Low VOC Content

Benefits

- High strength and tear resistant
- UV, moisture, and mold resistant
- Non-solvent for less odor and low VOC content
- Super high tack, aggressive bond to surfaces
- Can contribute toward satisfying EQ Credit 4.1 (Low Emitting Materials) under LEED®

Typical Test Values

	Standard UOM	Metric UOM	Test Method
Total Thickness	9.25 mils	0.235 mm	ASTM D-1000
Adhesion to Steel	70 oz/in	7.66 N/cm	PSTC-101
Tensile Strength	35 lb/in	61.29 N/cm	ASTM D-1000
Operating Temperature	40 to 200 °F	4 to 93 °C	
WVTR	>0.02 Perms		Mocon (100° F, 90% RH)
Smoke Developed	15		
Flame Spread	15		
VOC Content	<1 g/L		

Recommended Storage Conditions: 32-90 °F at 50% RH ± 2%
 Standard Shelf Life (at 25C): 36 months from date of manufacture.

The information presented herein was prepared at BERRY PLASTICS CORPORATION (25 Forge Parkway Franklin, MA 02038) by qualified technical personnel. To Berry Plastics' knowledge it is true and accurate. However, the information and recommendations are furnished for these products with the understanding that the purchaser or user, as the case may be, will independently determine that the product is suitable for the intended use, and that such use complies with all applicable federal, state and local laws and regulations. The data are typical values submitted only for the user's information and consideration, and do not constitute a warranty of any kind (including but not limited to a warranty of merchantability or of fitness for a particular purpose), or a representation for which BERRY PLASTICS assumes any legal responsibility.



Microlite® XG™

Formaldehyde-free™ Fiber Glass Duct Wrap Insulation

Description

Microlite XG Formaldehyde-free™ duct wrap insulation is a white, lightweight, highly resilient, blanket-type thermal insulation. The insulation blanket is manufactured from rotary-process fiber glass bonded with a special thermosetting acrylic resin.

Available Forms

Microlite XG Formaldehyde-free™ insulation is available in a variety of densities, thicknesses and roll lengths. It is supplied with an FSK (foil-scrim-kraft) vapor barrier facing to meet installed performance requirements, with a 2" (51 mm) stapling tab.

Uses

Microlite XG insulation is recommended as thermal insulation for the exterior of HVAC systems or other spaces or surfaces where temperature control is required.

Facing Information

FSK Aluminum Foil

Reinforced with fiber glass scrim laminated to UL-rated kraft.

Permeance: 0.02 perms*

*Per ASTM E96, Procedure A for facing material prior to lamination. After lamination, permeance values may be higher.

General Properties

Temperature (max.) – ASTM C411	250°F (121°C)
Water vapor sorption – ASTM C1104	<5% by weight
Corrosivity with steel – ASTM C665	Does not accelerate
Fungi resistance – ASTM C1338	Does not breed or promote

Standard Thicknesses and Packaging

Type	Thickness, in (mm)		
	100' Roll (31 m)	75' Roll (23 m)	50' Roll (15 m)
75	1½ (38)	2, 2½ (51, 58)	3 (76)
100	1½ (38)	2 (51)	–
150	–	1½ (38)	2 (51)

Note: Additional thicknesses, widths and other lengths available on special order. Contact Regional Sales Office for availability.



Surface Burning Characteristics

Microlite XG insulation meets the Surface Burning Characteristics and Limited Combustibility of the following standards:

Standard/Test Method

- ASTM E84
- UL 723
- NFPA 90A and 90B
- UL Guide No. 40 U8.3. Card R3711
- CAN/ULC S102-1188

Maximum Flame Spread Index	25
Maximum Smoke Developed Index	50

Note: Faced materials are tested as composite products (insulation, adhesive and facing).

Specification Compliance

ASTM C1290	Type 75, 100 & 150
ASTM C553*	
Type II	Type 75, 100 & 150
Type III	Type 150

*For faced material: 250°F (121°C) maximum temperature.

ASTM C1136s†	
Type II	FSK Facing

†Replaces HH-B-100B, Type II.

Canada: CGSB 51-GP-11M
NYC MEA 40-75-M

Green Building Certifications

Recycled Content	SCS Certified
ES 1350	Meets Requirements
ENERGY STAR®	Yes
LEED® Credits	See JM.com/buildgreen,
LEED® New Construction	JM LEED® Credit Guide (HIG-1231)



PLUS FORMALDEHYDE FREE
SCIENTIFIC CERTIFICATION SYSTEMS
SCS-IAQ-02088



5% Pre-consumer
20% Post-consumer
SCS-CERTIFIED CERTIFICATION SYSTEMS
SCS-MC-010738

Certified JM Formaldehyde-free™ Fiber Glass Insulation

Certified JM Formaldehyde-free™ fiber glass insulation offers superior thermal and acoustical performance—and it improves indoor air quality because it's made without formaldehyde. Why is that important? Because the U.S. Environmental Protection Agency (EPA) recommends limiting exposure to formaldehyde as much as possible, and the California Air Resources Board, a division of the California EPA, recommends that builders and architects use building materials and insulation made without formaldehyde.



Microlite® XG™

Formaldehyde-free™ Fiber Glass Duct Wrap Insulation

Application Recommendations

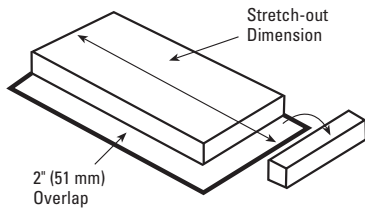
The R-value will vary depending upon how much the insulation is compressed during installation. To obtain the published installed R-values, the insulation stretch-out should be determined using the following table:

Duct Wrap Stretch-outs

Labeled Thick. (in)	Installed Compressed Thickness (in)	Stretch-out Dimension		
		Round	Square	Rectangular
1	0.75	P+ 7.0"	P+ 6.0"	P+ 5.0"
1½	1.125	P+ 9.5"	P+ 8.0"	P+ 7.0"
2	1.50	P+ 12.0"	P+ 10.0"	P+ 8.0"
2½	1.75	P+ 13.0"	P+ 11.0"	P+ 8.5"
3	2.25	P+ 17.0"	P+ 14.5"	P+ 11.5"

Stretch-outs include 2" (51 mm) for overlap. P = perimeter of duct to be insulated.

Prepare overlap by removing approximately 2" (51 mm) of insulation from facing.



Before applying duct wrap, sheet metal duct shall be clean, dry and tightly sealed at all joints and seams.

Wrap insulation around duct with facing to the outside so the 2" (51 mm) flap completely overlaps facing and insulation at the other end of stretch-out. Insulation shall be snugly butted.

Secure seams with outward clinching staples placed approximately 6" (152 mm) on center. If required, seal seam with pressure-sensitive tape designed for use with duct insulation. Insulation on the underside of ducts spanning 24" (610 mm) or greater shall be secured with mechanical fasteners and speed clips spaced approximately 18" (457 mm) on center. Fasteners should be cut off flush after the speed clips are installed, and when required, sealed with the same tape as specified above.

Adjacent sections of duct wrap insulation shall be snugly butted with the circumferential 2" (51 mm) tape flap overlapping and secured as recommended for the longitudinal seam. When a vapor seal is required, two coats of vapor retarder mastic reinforced with one layer of 4" (102 mm) wide, open-weave glass fabric may be used in lieu of pressure-sensitive tape.

Guide Specifications

Insulation for Metal Ducts. All ducts shall be insulated on the outside with a Formaldehyde-free™, flexible glass fiber blanket. Microlite XG Formaldehyde-free™ fiber glass duct wrap insulation should have a minimum installed R-value* of _____, and a Type _____ facing. Insulation shall be furnished with a factory-applied facing with a composite UL FHC rating of 25/50.

*The minimum insulation installed R-value should be determined in accordance to the duct operating and ambient conditions.

Thermal Conductivity (ASTM C518)

Type	k*		k	
	Compressed Thickness		Labeled Thickness	
	Btu•in/(hr•ft²•°F)	W/m•°C	Btu•in/(hr•ft²•°F)	W/m•°C
75	0.27	0.039	0.29	0.042
100	0.25	0.036	0.27	0.039
150	0.24	0.035	0.25	0.036

Conductivity at 75°F (24°C) mean temperature.

*Tested with material thickness compressed 25%.

Installed R-values

Type	Labeled Thickness		Installed "R"***		Out-of-Package "R"	
	in	mm	(hr•ft²•°F)/Btu	m²•°C/W	(hr•ft²•°F)/Btu	m²•°C/W
75	1½	38	4.2	0.74	5.2	0.92
	2	51	5.6	0.99	6.9	1.22
	2½	58	6.5	1.15	8.0	1.41
100	3	76	8.3	1.46	10.3	1.81
	1½	38	4.5	0.79	5.6	0.99
150	2	51	6.0	1.06	7.4	1.30
	1½	38	4.7	0.83	6.0	1.06
	2	51	6.3	1.11	8.0	1.41

***Installed R-value calculated with a material thickness compressed to a maximum of 25% following recommended duct wrap stretch-outs.



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specJM.com

North American Sales Offices, Insulation Systems

Eastern Region

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Fax: (419) 784-7866

Western Region and Canada

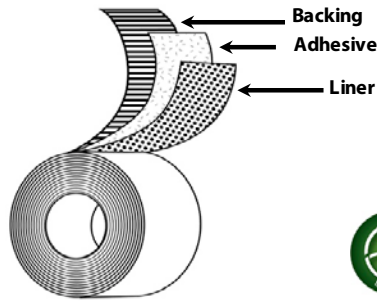
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Denver, CO 80217
(800) 368-4431
Fax: (303) 978-4661

The physical and chemical properties of the Microlite® XG™ Formaldehyde-free™ fiber glass duct Wrap Insulation listed herein represent typical, average values obtained in accordance with accepted test methods and are subject to normal manufacturing variations. They are supplied as a technical service and are subject to change without notice. Numerical flame spread and smoke developed ratings are not intended to reflect hazards presented by these or any other materials under actual fire conditions. Check with the Regional Sales Office nearest you to ensure current information. **All Johns Manville products are sold subject to Johns Manville's standard Terms and Conditions, including Limited Warranty and Limitation of Remedy. For a copy of the Johns Manville standard Terms and Conditions, Limited Warranty and Limitation of Remedy, and information on other Johns Manville thermal insulation and systems, call (800) 654-3103.**

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Insulation Jacketing Tape



Backing: Foil/Scrim/Kraft Paper Laminate
Adhesive: Synthetic Rubber
Liner: Unbleached Natural Kraft Paper
Colors: Aluminum

Specifications: Tested in accordance with UL723
Standard Sizes: 72mm x 46M

Applications

- Vapor barrier seal for insulation facing
- Sealing insulation and repairing in cooler/refrigeration applications

Features

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- Synthetic Rubber Adhesive
- Low VOC Content

Benefits

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- UV, moisture, and mold resistant
- Non-solvent for less odor and low VOC content
- Super high tack, aggressive bond to surfaces
- Can contribute toward satisfying EQ Credit 4.1 (Low Emitting Materials) under LEED®

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