

Quality People. Building Solutions.

Comfort Systems USA (Arkansas), Inc.
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Date: 1/17/2024

Return Request: 1/27/2024

Project: Academies of Math & Science Little Rock

Supplier: Pro Insulation

Manufacturer: Various

Submittal: HVAC Duct Insulation

Submittal Number: 23 00 00-03

Drawing # and Installation: Mechanical Drawings

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Little Rock, AR 72211
501-223-9302

ENGINEER

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GENERAL CONTRACTOR

Clark Contractors
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MECHANICAL SUBCONTRACTOR

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N. Little Rock, AR 72117
501-834-3320

Notes:

CSUSA PROJECT NO.

23-1028

jon@comfortar.com

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No. Little Rock, AR 72117

Pro Insulation

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Ph. 479-646-5644
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January 12, 2024

Comfort Systems USA, Inc.
P.O. Box 16620
Little Rock, AR 72231

Mr. Jon Davis

Re: Mechanical Insulation Submittals for Academy of Math & Science, Little Rock,
Arkansas.

Spec section 23 00 00.

The following items will be insulated with $\frac{3}{4}$ lb Knauf Atmosphere Duct Wrap with a foil
skrim kraft vapor barrier jacket. All joints and seams will be sealed with 3" wide FSK
tape.

Item #1 Round Supply Duct----- 2 3/16" Thick

Item #2 Round Return Duct----- 2 3/16" Thick

Thank You,

Mike Galatzer

DATA SHEET

Atmosphere™ Duct Wrap

with ECOSE® Technology



DESCRIPTION

Atmosphere Duct Wrap is a thermal and acoustical insulation blanket made from highly resilient, inorganic fiberglass bonded by ECOSE Technology. It is available unfaced, with a foil-scrim-kraft (FSK) jacket and with a white metalized polypropylene-scrim-kraft (PSK) jacket. Vapor retarders provide a 2" (51 mm) staple flange on one edge, and the factory-applied facing assures uniform quality.

APPLICATION

- External insulation on commercial or residential heating or air conditioning ducts
- Suitable for the exterior of rectangular or round sheet metal ducts and spaces or surfaces where temperature and condensation must be controlled

SPECIFICATION COMPLIANCE

U.S.

- ASTM C1139 - unfaced; Type I, Type II,
 - Grade 1 - 0.75 PCF
 - Grade 2 - 1.0 PCF
 - Grade 3 - 1.5 PCF
- ASTM C553
 - Type I, Type II - 0.75 PCF
 - Type I, Type II - 1.0 PCF
 - Type I, II, III - 1.5 PCF
- ASTM C1136; Type II
- ASTM C1290
- NFPA 90A and 90B
- California Title 24 (installed at 25% compression)
- UL/ULC Classified

Canada

- CAN/ULC S102

INDOOR AIR QUALITY

- UL Environment
 - GREENGUARD Certified
 - GREENGUARD Gold Certified
 - Validated to be Formaldehyde-Free
- Does not contain polybrominated diphenyl ethers (PBDE) such as: Penta-BDE, Octa-BDE or Deca-BDE
- EUCEB Certified

CONTRACTOR: _____

JOB: _____

DATE: _____

DOING MORE FOR THE WORLD WE LIVE IN.

Knauf Insulation products with ECOSE® Technology are made using our patented, bio-based binder - a smarter alternative to the phenol/formaldehyde (PF) binder traditionally used in fiberglass products. The bio-based binder holds our product together, gives the product its unique appearance and makes it formaldehyde-free.

All of our products are made from sustainable resources, such as recycled glass and sand. And we're proud to be putting glass bottles back to work rather than into landfills. Our products are made with a minimum of 50% recycled glass—totaling an average of 26 million bottles each month.

with ECOSE[®]
TECHNOLOGY



FIBERGLASS AND MOLD

Fiberglass insulation will not sustain mold growth. However, mold can grow on almost any material when it becomes wet and contaminated. Carefully inspect any insulation that has been exposed to water. If it shows any sign of mold, it must be discarded. If the material is wet but shows no evidence of mold, it should be dried rapidly and thoroughly. If it shows signs of facing degradation from wetting, it should be replaced.

Air handling insulation used in the air stream must be discarded if exposed to water.

TECHNICAL DATA		
Property (Unit)	Test	Performance
Corrosiveness	ASTM C665	Does not accelerate corrosion of steel
Corrosion	ASTM C1617	Pass
Maximum Service Temperature	ASTM C411	Faced: 250° F (121° C), Unfaced: 350° F (177° C)
Water Vapor Permeance	ASTM E96, Procedure A	0.02 perms or less (FSK and PSK facings)
Water Vapor Sorption (by weight)	ASTM C1104	Less than 5%
Mold Growth	ASTM C1338	Pass
Surface Burning Characteristics (flame spread/smoke developed)	ASTM E84, UL 723, CAN/ULC S102	UL/ULC Classified FHC 25/50 (Unfaced and FSK facing)
	ASTM E84	25/50 (PSK facing)

FORMS AVAILABLE						
Density	Thickness	Width	Length	Facing	R-Value (K Value) @ 75°F Mean Temperature	
					Out-Of Package	Installed [at 25% Compression]
0.75 PCF (12 kg/m ³)	1½" (38 mm)	48" (1,219 mm)	100' (30.48 m)	FSK, PSK, Unfaced	R-5.1 (0.29)	R-4.2 (0.27)
	2" (51 mm)		75' (22.86 m)		R-6.8 (0.29)	R-5.6 (0.27)
	2⅜" (56 mm)		75' (22.86 m)		R-7.4 (0.29)	R-6.0 (0.27)
	3" (76 mm)		50' (15.24 m)		R-10.2 (0.29)	R-8.4 (0.27)
1.0 PCF (16 kg/m ³)	1½" (38 mm)		100' (30.48 m)		R-5.6 (0.27)	R-4.5 (0.25)
	2" (51 mm)		75' (22.86 m)		R-7.4 (0.27)	R-6.0 (0.25)
1.5 PCF (24 kg/m ³)	1½" (38 mm)		75' (22.86 m)		R-6.1 (0.24)	R-4.8 (0.23)
	2" (51 mm)		50' (15.24 m)		R-8.2 (0.24)	R-6.4 (0.23)

STRETCH-OUTS				
Labeled Thickness	Installed Compressed Thickness	Round	Square	Rectangular
1½" (38 mm)	1⅜" (29 mm)	P+9½" (241 mm)	P+8" (203 mm)	P+7" (178 mm)
2" (51 mm)	1½" (38 mm)	P+12" (305 mm)	P+10" (254 mm)	P+8" (203 mm)
2⅜" (56 mm)	1⅝" (42 mm)	P+13" (330 mm)	P+11" (279 mm)	P+8½" (216 mm)
3" (76 mm)	2¼" (57 mm)	P+17" (432 mm)	P+14½" (368 mm)	P+11½" (292 mm)

P = Perimeter of duct to be installed.

**INSERTION LOSS | (REDUCTION OF SOUND TRANSMITTED THROUGH DUCT WALL)
(SOUND AND VIBRATION DESIGN AND ANALYSIS, NATIONAL ENVIRONMENTAL BALANCING BUREAU, 1994)**

Duct Dimensions	Sheet Metal	Duct Wrap		Insertion Loss, dB/LF of Duct						
		Nominal Thickness	Nominal Density	63Hz	125Hz	250Hz	500Hz	1000Hz	2000Hz	4000Hz
12" x 12" (305 mm x 305 mm)	24 GA	1½" (38 mm)	0.75 PCF (12 kg/m ³)	0.6	0.6	0.6	0.7	7.4	14.2	20.9
24" x 12" (610 mm x 305 mm)	24 GA	1½" (38 mm)		0.6	0.6	0.6	0.7	7.4	14.2	20.9
48" x 12" (1219 mm x 305 mm)	22 GA	1½" (38 mm)		0.5	0.5	0.5	0.6	7.4	14.1	20.9
24" x 24" (610 mm x 610 mm)	22 GA	1½" (38 mm)		0.5	0.5	0.5	0.6	7.4	14.1	20.9
24" x 12" (610 mm x 305 mm)	26 GA	1½" (38 mm)		0.8	0.8	0.8	0.8	7.5	14.2	21.0
24" x 8" (610 mm x 203 mm)	26 GA	2" (51 mm)		1.0	1.0	1.0	3.6	10.4	17.1	23.9

**CONDENSATION CONTROL | RECOMMENDED MIN. INSTALL R-VALUES FOR CONDENSATION CONTROL ON FLAT SURFACES.
SURFACE EMITTANCE: 0.2 (AGED ALUMINUM FOIL OR GALVANIZED SHEET METAL)**

RH	Operating Temperature														
	45° F (7° C) Ambient Temperature (° F)					55° F (13° C) Ambient Temperature (° F)					60° F (18° C) Ambient Temperature (° F)				
	70	80	90	100	110	70	80	90	100	110	70	80	90	100	110
60	2.2 ¹	3.3 ¹	4.3 ²	4.3 ²	5.4 ³	1.1 ¹	2.2 ¹	3.3 ¹	3.3 ¹	4.3 ²	1.1 ¹	1.1 ¹	2.2 ¹	3.3 ¹	4.3 ²
70	3.3 ¹	5.4 ³	6.5 ⁴	7.6 ⁵	—	1.1 ¹	3.3 ¹	4.3 ²	6.5 ⁴	6.5 ⁴	1.1 ¹	1.1 ¹	3.3 ¹	5.4 ³	6.5 ⁴
80	7.0 ⁴	—	—	—	—	3.3 ¹	6.5 ⁴	—	—	—	2.2 ¹	3.3 ¹	6.5 ⁴	—	—
90	—	—	—	—	—	—	—	—	—	—	6.5 ⁴	—	—	—	—

¹All Duct Wrap products

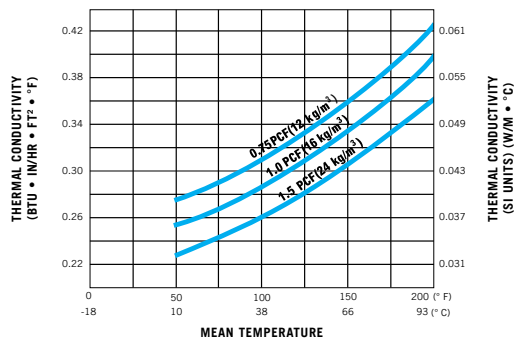
²0.75 PCF, 2" and greater; 1.0 PCF, 1½" and greater; 1.5 PCF, 1½" and greater

³0.75 PCF, 2" and greater; 1.0 PCF, 2"; 1.5 PCF, 2"

⁴0.75 PCF

⁵0.75 PCF, 3"

THERMAL EFFICIENCY | ASTM C177

	Mean Temperature	0.75 PCF		1.0 PCF		1.5 PCF	
		k	k (SI)	k	k (SI)	k	k (SI)
		50° F (10° C)	0.28	0.040	0.26	0.037	0.23
	75° F (24° C)	0.29	0.042	0.27	0.039	0.24	0.035
	100° F (38° C)	0.31	0.045	0.29	0.042	0.26	0.037
	125° F (52° C)	0.33	0.048	0.31	0.045	0.28	0.040
	150° F (66° C)	0.36	0.052	0.34	0.049	0.31	0.042
	175° F (80° C)	0.39	0.056	0.37	0.053	0.33	0.048
	200° F (93° C)	0.43	0.063	0.40	0.058	0.36	0.052

APPLICATION & SPECIFICATION GUIDELINES

Storage

- Protect stored insulation from water damage, construction damage and other abuse.
- If stored outside, proper protection from weather conditions should be provided.

Preparation

- Install over clean, dry sheet metal ducts.
- All sheet metal joints and seams must be sealed to prevent air leakage from the duct.

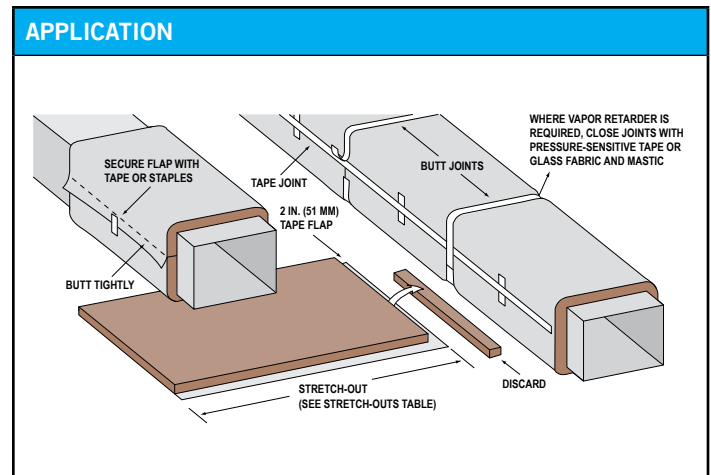
Application

- Install with facing to the outside to obtain specified R-value using a maximum of 25% compression.
- Butt all insulation joints firmly together. Longitudinal seam of the vapor retarder must be overlapped a minimum of 2" (51 mm). A 2" (51 mm) tab is provided for the circumferential seam and must be overlapped.
- Where vapor retarder performance is necessary, all penetrations, joints, seams and damage to the facing should be sealed with an FSK, PSK or foil tape or glass fabric and mastic prior to system startup.
- Pressure sensitive tapes should be a nominal 3" (76 mm) wide and be applied with moving pressure using an appropriate sealing tool. Staples should be outward clinch and placed approximately 6" (152 mm) on center.
- Closure systems should have a 25/50 F.H.C. per UL 723.
- For rectangular ducts over 24" (610 mm) wide, secure the insulation to the bottom side of the duct with mechanical fasteners spaced on 18" (457 mm) centers to reduce sag. Care should be taken to avoid over-compressing the insulation with the retaining washer.

- It is neither necessary nor desirable to adhere duct wrap to duct surfaces with adhesive.
- Unfaced Duct Wrap should be overlapped with a minimum of 2" (51 mm) and fastened with 4" (102 mm) to 6" (152 mm) nails or skewers placed 4" (102 mm) apart, or secured with a wire or banding system. Care must be taken to avoid damaging the duct wrap. Refer to diagram for staple stitching and butt-joint method.

Installation Procedures

- Use the Application graphic to determine stretch-outs required for the nominal thickness of insulation to limit average compression of the insulation 25% or less.



CERTIFICATIONS



Check with your Knauf Insulation Territory Manager to ensure information is current.

The chemical and physical properties of this product represent average values determined in accordance with accepted test methods. The data is subject to normal manufacturing variations. The data is supplied as a technical service and is subject to change without notice. References to numerical flame spread ratings are not intended to reflect hazards presented by these or any other materials under actual fire conditions.

This product is covered by one or more U.S. and/or other patents.
See patent www.knaufnorthamerica.com/patents

Visit knaufnorthamerica.com to learn more.

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02-20

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FASSON® 0828

Suitable for die-cut shapes, shielding, moisture and vapor barrier sealing components or lamination to insulation materials.

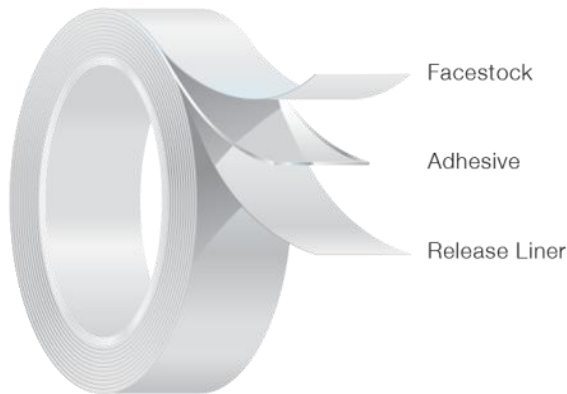
FEATURES:

- Specially formulated antimicrobial, extreme weather, COLD TOUGH™ acrylic adhesive
- High initial tack and quick stick
- Meets ASTM C-1136 Type II and Type IV
- PSA complies with South Coast Air Quality Management District's (SCAQMD) Rule 1168.
- UL 723 Recognition under File No. BVYS.R7078
- UL ULC S102 Recognition under File No. BVYS7.R7078

BENEFITS:

- Tri-directional 8.0 mil FSK facestock reinforces seal
- Strong bond to a variety of substrates
- High-strength reinforced FSK reinforces seal
- All weather acrylic insulation sealant tape
- Foil laminate facing (FSK) is decaBDE free
- Application temperature as low as 0°F

Made in the USA



CONSTRUCTION:

Carrier:

Tri-directional FSK Foil Laminate

Adhesive:

COLD TOUGH™ Acrylic

Liner:

Densified Kraft



General Use Tape Surface Burning Characteristics to

UL 723	Flame Spread	15
	Smoke Developed	10
722S		

LEED® Point Contributor

* Contributes to Energy Atmosphere (SA) Credit 1

* Contributes to Indoor Environmental Quality (IEC) Credit 4.1

FASSON® 0828

Adhesive Properties:		Typical Values		
Thickness	Test Method(s): PSTC-133	US MILS	MM's	Microns (µm)
Liner:		3.6	0.09	91
Adhesive:		1.7	0.04	43
Carrier:		8.0	0.20	203
Total Caliper:		13.3	0.34	338

PEEL ADHESION		Test Method(s): PSTC-101, ASTM D-3330, STD-10		
Product 180° 12" min				
Substrate		Lbf / In	US Oz / In	N / Meter
SS	Initial	6.5	104	1138

TLMI RELEASE		Test Method(s): PSTC-4, STD-8		
Product 90° 300" / min				
Substrate		Gf / 2 In w		
SS	Initial	40.0		

TENSILE		Test Method(s): PSTC-131, ASTM D-882, STD-3A,B,C		
Product 180°				
Substrate		Lbf / In	US Oz / In	N / Meter
Product	Initial MD	40.0	640	7004
	Initial CD	25.0	400	4378

ELONGATION		Test Method(s): PSTC-131, ASTM D-882, STD-3A,B,C		
Product 90° MD				
Substrate		%		
Product	Initial MD	< 1		
	Initial CD	< 1		

STATIC SHEAR		Test Method(s): PSTC-107, ASTM D 3654, STD-9		
Aluminum Foil 1" sq (6.5 cm2) 2500 g				
Substrate		Min to Fail		
SS		> 10,000		

VOC Content				
Product				
Substrate		g / L		
Product		< 15		

TEMPERATURES		° F	° C
Min Application Temp		0 ° F	-17 ° C
Max Continuous Operating Temp		200 ° F	93 ° C
Max Intermittent Operating Temp		250 ° F	121 ° C

THE LISTED VALUES ARE TYPICAL AND NOT INTENDED TO SERVE AS PRODUCT SPECIFICATIONS

APPLICATION TECHNIQUES

- It is essential, as with all pressure-sensitive tapes, that the surface to which the tape is applied be clean, dry, and free of grease or oil
- Bond strength is dependent upon the amount of adhesive-to-surface contact developed
- Note that different pressure, time and temperature on different (film / rigid) surface achieves different performance

STORAGE / SHELF LIFE

- One year when stored at 64-72°F (18-22°C) / 30-70% relative humidity, out of direct sunlight and in original packaging.

Please refer to Tapes.AveryDennison.com for complete terms and conditions, including warranty terms, relating to this product. You should periodically review the site as terms and conditions are subject to change without notice.

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