Quality People. Building Solutions.

Comfort Systems USA (Arkansas), Inc.
P.O. Box 16620
Little Rock, AR 72231
Phone 501-834-3320
Fax 501-834-5416

Date: 2/4/2025
Return Request: 2/14/2025
Project: City Of Sherwood Public Works (Administration Building)
Supplier: Pro Insulation
Manufacturer: Various
Submittal: Duct Insulation
Submittal Number: 23 07 13-01
Drawing # and Installation: Mechanical Drawings

ARCHITECT
Cromwell
1300 East 6th Street
Little Rock, AR 72202
501-372-2900

ENGINEER
Cromwell
1300 East 6th Street
Little Rock, AR 72202
501-372-2900

GENERAL CONTRACTOR
Baldwin & Shell
1000 W. Capitol Ave.
Little Rock, AR 72201
501-374-8677

MECHANICAL SUBCONTRACTOR
Comfort Systems USA (Arkansas), Inc.
9924 Landers Rd.
N. Little Rock, AR 72117
501-834-3320

Notes:

CSUSA PROJECT NO.
24-6084
sean@comfortar.com

Pro Insulation

4414 South 16th Street
Ft. Smith, AR 72901
Ph. 479-646-5644
Fax 479-646-5654

January 21, 2025

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

Mr. Sean Cross

Re: Mechanical Insulation Submittals for Sherwood Public Works, Sherwood, Arkansas.

Spec section 23 07 13.

The following items will be insulated with ¾ 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 Supply Duct---------- 2 3/16" Thick

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

Item #3 Outside Air Duct---------- 2 3/16" Thick

Thank You,

Mike Galatzer

DATA SHEET

Atmosphere® Duct Wrap

with ECOSE® Technology

CONTRACTOR: _____

JOB: _____

DATE: _____

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 C1290
- ASTM C553
  - Type I, Type II - 0.75 PCF (12 kg/m³)
  - Type I, Type II - 1.0 PCF (16 kg/m³)
  - Type I, II, III - 1.5 PCF (24 kg/m³)
- ASTM C1136; Type II
- 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

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

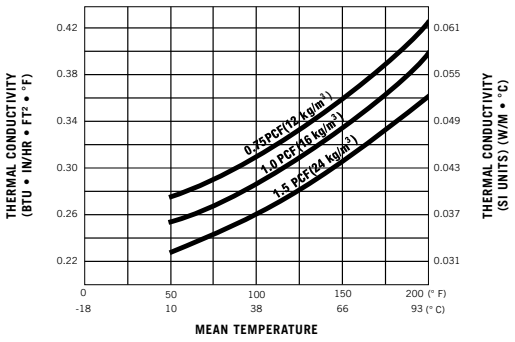
Fiberglass insulation will not sustain mold growth. However, mold can grow on almost any material when it becomes wet and contaminated. Carefully inspect any insulation that has been exposed to water. If it shows any sign of mold, it must be discarded. If the material is wet but shows no evidence of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

Insulation used in direct contact with air streams that provide conditioning to occupied spaces 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/m³)	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)
	2 3/16" (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)
	4 5/16" (110 mm)		45' (13.71 m)		R-14.7 (0.29)	R-12 (0.27)
1.0 PCF (16 kg/m³)	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/m³)	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)

THERMAL EFFICIENCY | ASTM C177



Mean Temperature	0.75 PCF (12 kg/m³)		1.0 PCF (16 kg/m³)		1.5 PCF (24 kg/m³)	
	k	k (SI)	k	k (SI)	k	k (SI)
50° F (10° C)	0.28	0.040	0.26	0.037	0.23	0.033
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

INSERTION LOSS | (REDUCTION OF SOUND TRANSMITTED THROUGH DUCT WALL) (SOUND AND VIBRATION DESIGN AND ANALYSIS, NATIONAL ENVIRONMENTAL BALANCING BUREAU, 1994)										
		Duct Wrap		Insertion Loss, dB/LF of Duct						
Duct Dimensions	Sheet Metal	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/m³)	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

STRETCH-OUTS				
Labeled Thickness	Installed Compressed Thickness	Round	Square	Rectangular
1½" (38 mm)	1⅛" (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)
2³⁄₁₆" (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)
4⁵⁄₁₆" (110 mm)	3¼" (83 mm)	P+22½" (572 mm)	P+18" (457 mm)	P+19" (483 mm)

P = Perimeter of duct to be installed.

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.

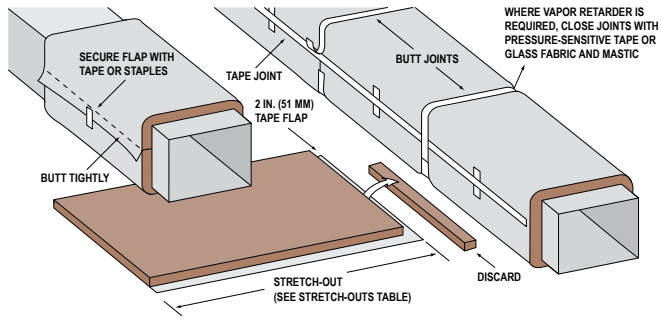
Application

- 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.
- The use of bonding adhesive is not recommended for attaching duct wrap to the duct surface. The use of bonding adhesive may restrict duct wrap from expanding to full thickness. This loss of thickness will result in decreased thermal performance which may lead to condensation issues on below ambient ductwork. Use of bonding adhesive voids warranty and performance claims and potentially the UL rating of Knauf Insulation duct wrap.
- 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.

APPLICATION



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.

KNAUF INSULATION, INC.
One Knauf Drive
Shelbyville, IN 46176

Technical Support
(317) 398-4434 ext. 8727
info.us@knaufinsulation.com

03-21

FASSON® 0828

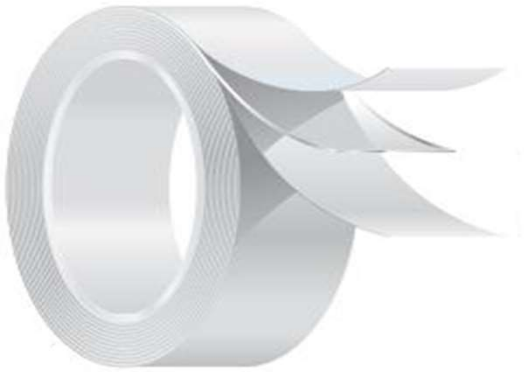
Avery Dennison FASSON® 0828 is suitable for die-cut shapes, shielding, moisture and vapor barrier sealing components or lamination to insulation materials.

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 CDPH Standard Method V1.2
- 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
- CDPH V1.2 recognized by USGBC LEED, WELL building standard, ANSI/GBI 01-2019, and more
- High-strength reinforced FSK reinforces seal and is decaBDE free
- Application temperature as low as 0ºF
- Made in the USA



CONSTRUCTION:

Liner:
60# White Kraft

Adhesive:
COLD TOUGH® Acrylic

Carrier:
Tri-directional FSK Foil Laminate

	General Use Tape Surface Burning Characteristcs to	
UL 723	**Flame Spread**	**10**
722S	**Smoke Developed**	**15**

FASSON® 0828

Adhesive Properties:		Typical Values		
Thickness	ASTM D3652	**US Mils**	**MM's**	**Micron's (µm)**
Liner		3.5	0.09	89
Adhesive		1.7	0.04	43
Carrier		8.0	0.20	203
Total Caliper without Liner:		9.7	0.25	246
Total Caliper:		13.2	0.34	335

Peel Adhesion	ASTM D3330		
180° 12 in (300 mm) min @ Room Temp			
Substrate		**Lbf / in**	**N / Meter**
SS	INITIAL	6.5	1,145

Static Shear	ASTM D3564		
180° 1" sq (6.5 cm2) 2500 g @ Room Temp			
Substrate		**Min to Fail**	
SS	INITIAL	> 10000	

Tensile	ASTM D882		
180° 2 in (50.8 mm) / min @ Break @ Room Temp			
Substrate		**Lbf / in**	**N / Meter**
Product	MD	40	7,044
Product	CD	25.0	4,403

TLMI Release			
		Gf / 2 in w	
Product	INITIAL	40.0	

VOC			
VOC		**mg / m³**	
Product		< 0.5	

TEMPERATURES	**° F**	**° C**
Minimum Application Temperature	0° F	-18° C
Maximum Continuous Operating Temperature	200° F	93° C
Maximum Intermittent Operating Temperature	250° F	120° 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 64-72ºF (18-22ºC) / 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.

AVERY DENNISON | Performance Tapes

Asia Pacific
Kunshan, China,
NO. 618 Nanhe Road
Kunshan Economic &
Technological Zone
China, 215335
+86 512 57155001
Fax: +86 512 57155059

Europe
Tieblokkenlaan 1
B-2300 Turnhout
Belgium
+32 (0)14 40 48 11
Fax: +32 (0)14 40 48 55

North America
250 Chester Street
Painesville, Ohio
44077 USA
+1 866-462-8379
Fax: +1 888-358-4469

Pro Insulation

4414 South 16th Street
Ft. Smith, AR 72901
Ph. 479-646-5644
Fax 479-646-5654

January 21, 2025

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

Mr. Sean Cross

Re: Mechanical Insulation Submittals for Sherwood Public Works, Sherwood, Arkansas.

Spec section 23 07 13.

The following items will be insulated with Knauf 3 lb Earthwool Insulation Board with an FSK vapor barrier jacket. All joints and seams will be sealed with 3" wide FSK tape.

*Exterior will receive an additional Alumaguard all weather jacketing.

Item #1 Exterior Rectangular Supply Duct---------- 2" Thick

Item #2 Exterior Rectangular Return Duct---------- 2" Thick

Thank You,

Mike Galatzer

DATA SHEET

Earthwool® Insulation Board

with ECOSE® Technology

DESCRIPTION

Earthwool Insulation Board is a versatile product for thermal and acoustical applications made from highly resilient, inorganic glass fibers bonded with ECOSE Technology. It is available plain or with a factory-applied foil-scrim-kraft (FSK) facing or all-service jacket (ASJ+).

APPLICATION

- Heating and air conditioning ducts
- Power and process equipment
- Boiler and stack installations
- Metal and masonry walls
- Wall and roof panel systems
- Curtain wall assemblies
- Cavity walls

SPECIFICATION COMPLIANCE

U.S.

- UL/ULC Classified (FSK, ASJ+)
- ASTM C612;
  - Type IA (1.6, 2.25, 3.0, 4.25, 6.0 PCF) (26, 36, 48, 68, 96 kg/m³),
  - Type IB (3.0, 4.25, 6.0 PCF) (48, 68, 96 kg/m³)
- ASTM C553; Type I, II, III (1.6 PCF)
- ASTM C1136 (facing);
  - Type I, II, III, IV, VIII, X (ASJ+), Type II, IV (FSK)
- California Title 24
- HH-B-100B; Type I (ASJ+ facing), Type II (FSK facing)
- HH-I-558C;
  - Form A, Class 1 (1.6, 2.25, 3.0, 4.25, 6.0 PCF) (26, 36, 48, 68, 96 kg/m³)
  - Form A, Class 2 (3.0, 4.25, 6.0 PCF) (48, 68, 96 kg/m³)
- NFPA 90A and 90B

- ASTM C795, MIL-I-24244, NRC Reg. Guide 1.36 (Certification needs to be specified at time of order, **special custom order required for certification**)

Canada

- CAN/ULC S102
- CGSB 51-GP-10M
- CGSB 51-GP-52M (facings)

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

INDOOR AIR QUALITY

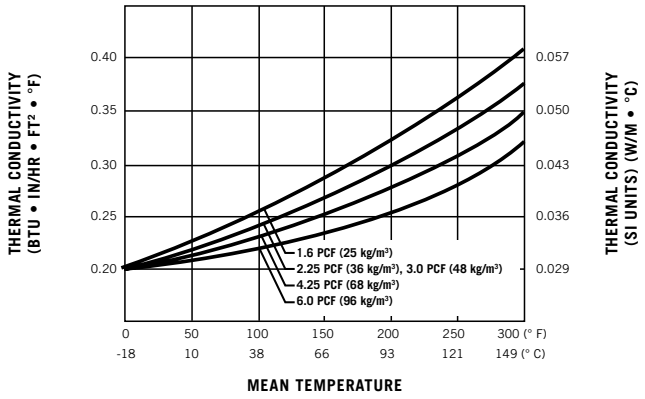
- UL Environment
  - GREENGUARD Certified
  - GREENGUARD Gold Certified
  - Validated to be Formaldehyde-Free
- Does not contain polybrominated diphenyl ethers (PBDE) such as: Penta–BDE, Octa–BDE or Deca–BDE
- EUCEB Certified
- IgCC Section 806.6 compliant

TECHNICAL DATA		
Property (Unit)	**Test**	**Performance**
Corrosiveness	ASTM C665	Does not accelerate corrosion of steel
Corrosion	ASTM C1617	Pass
Maximum Service Temperature	ASTM C411	450° F (232° C)
Smoulder Resistance	CAN/ULC S129	Pass
Non-combustible	CAN/ULC S114	Pass
Bursting Strength	ASTM D774	FSK facing: 40 PSI, ASJ+ facing: 100 PSI
Water Vapor Permeance	ASTM E96, Procedure A	FSK facing: 0.02 perms ASJ+ facing: 0.01 perms
Water Vapor Sorption (by weight)	ASTM C1104	Less than 5%
Shrinkage	ASTM C356	Less than 0.3%
Mold Growth	ASTM C1338	Pass
Surface Burning Characteristics (flame spread/smoke developed)	ASTM E84, UL 723, CAN/ULC S102, NFPA 90A and 90B	UL/ULC Classified FHC 25/50

FORMS AVAILABLE*		
Density	**Thickness**	**R-Value (R-SI)**
1.6 PCF (26 kg/m³)	1½" (38 mm)	R-6.3 (1.1)
	2" (51 mm)	R-8.3 (1.5)
	3" (76 mm)	R-12.5 (2.2)
	4" (102 mm)	R-16.7 (2.9)
2.25 PCF (36 kg/m³)	1" (25 mm)	R-4.3 (0.8)
	1½" (38 mm)	R-6.5 (1.1)
	2" (51 mm)	R-8.7 (1.5)
	3" (76 mm)	R-13.0 (2.3)
	4" (102 mm)	R-17.4 (3.1)
3.0 PCF (48 kg/m³)	1" (25 mm)	R-4.3 (0.8)
	1½" (38 mm)	R-6.5 (1.1)
	2" (51 mm)	R-8.7 (1.5)
	2½" (64 mm)	R-10.9 (1.9)
	3" (76 mm)	R-13.0 (2.3)
	4" (102 mm)	R-17.4 (3.1)
4.25 PCF† (68 kg/m³)	1" (25 mm)	R-4.3 (0.8)
	1½" (38 mm)	R-6.5 (1.1)
	2" (51 mm)	R-8.7 (1.5)
	2½" (64 mm)	R-10.9 (1.9)
6.0 PCF† (96 kg/m³)	1" (25 mm)	R-4.4 (0.8)
	1½" (38 mm)	R-6.7 (1.2)
	2" (51 mm)	R-8.9 (1.6)

*Available in widths of 24" (610 mm) and 48" (1219 mm) and lengths from 36" to 120" (915 mm to 3048 mm).
†Cartons only.

THERMAL CONDUCTIVITY | ASTM C177



Mean Temperature	1.6 PCF		3.0 PCF		6.0 PCF	
	k	k(SI)	k	k(SI)	k	k(SI)
75° F (24° C)	0.24	0.035	0.23	0.033	0.22	0.032
100° F (38° C)	0.25	0.036	0.24	0.035	0.23	0.033
200° F (93° C)	0.33	0.048	0.29	0.042	0.27	0.039
300° F (149° C)	0.42	0.061	0.37	0.053	0.34	0.049

SOUND ABSORPTION COEFFICIENTS I ASTM C423, TYPE A MOUNTING									
Type	Facing	Thickness	Octave Band Center Frequency (cycles/sec.)						
			125	250	500	1000	2000	4000	NRC
1.6 PCF (26 kg/m³)	Plain	1½" (38 mm)	0.19	0.44	0.86	0.98	1.00	1.02	0.80
		2" (51 mm)	0.31	0.57	0.96	1.04	1.03	1.03	0.90
		2½" (64 mm)	0.43	0.82	1.12	1.07	1.04	1.03	1.00
		3" (76 mm)	0.47	0.92	1.17	1.06	1.06	1.04	1.05
2.25 PCF (36 kg/m³)	Plain	1" 25 mm)	0.05	0.24	0.59	0.86	0.97	1.00	0.65
		1½" (38 mm)	0.17	0.49	0.93	1.03	1.03	0.99	0.85
		2" (51 mm)	0.26	0.62	1.05	1.07	1.04	1.05	0.95
	FSK	1" (25 mm)	0.14	0.69	0.81	0.99	0.55	0.27	0.75
		2" (51 mm)	0.63	0.76	1.11	0.75	0.42	0.22	0.75
3.0 PCF (48 kg/m³)	Plain	1" (25 mm)	0.08	0.23	0.62	0.88	0.96	0.99	0.65
		1½" (38 mm)	0.09	0.39	0.89	1.03	1.06	1.01	0.85
		2" (51 mm)	0.29	0.65	1.11	1.13	1.06	1.03	1.00
		3" (76 mm)	0.54	1.01	1.18	1.07	1.07	1.04	1.10
		4" (102 mm)	0.95	1.11	1.17	1.07	1.07	1.06	1.10
	FSK	1" (25 mm)	0.21	0.63	0.84	0.93	0.51	0.22	0.75
		1½" (38 mm)	0.45	0.60	0.99	0.73	0.53	0.27	0.70
		2" (51 mm)	0.67	0.77	0.93	0.74	0.47	0.28	0.75
	ASJ+	1" (25 mm)	0.15	0.71	0.65	0.82	0.41	0.16	0.65
		1½" (38 mm)	0.42	0.55	0.91	0.69	0.40	0.23	0.65
		2" (51 mm)	0.75	0.71	0.80	0.66	0.41	0.24	0.65
4.25 PCF (68 kg/m³)	Plain	1" (25 mm)	0.06	0.24	0.69	0.99	1.05	1.02	0.75
	ASJ+	2½" (64 mm)	0.75	0.63	0.63	0.62	0.41	0.25	0.55
6.0 PCF (96 kg/m³)	Plain	1" (25 mm)	0.05	0.26	0.77	1.04	1.04	1.03	0.80
		1½" (38 mm)	0.13	0.58	1.01	1.05	1.00	1.01	0.90
		2" (51 mm)	0.32	0.81	1.08	1.06	1.03	1.04	1.00
	FSK	1" (25 mm)	0.23	0.65	0.39	0.48	0.47	0.32	0.50
		1½" (38 mm)	0.61	0.47	0.78	0.61	0.51	0.35	0.60
		2" (51 mm)	0.77	0.50	0.72	0.58	0.53	0.41	0.60
	ASJ+	1½" (38 mm)	0.60	0.46	0.62	0.48	0.47	0.31	0.50
		2" (51 mm)	0.77	0.44	0.60	0.50	0.41	0.30	0.50

CERTIFICATIONS

APPLICATION & SPECIFICATION GUIDELINES

Storage

- Protect material from water damage or other abuse. Cartons are not designed for outside storage. Vacuum packaged material can be stored outside if care is taken not to puncture the poly bag.

Preparation

- Apply the product on clean, dry surfaces. Metal ducts must be sealed before application. Prescore rigid insulation board where necessary to conform to curved surfaces.

Application: General

- All insulation joints must be firmly butted. Insulation can be secured with mechanical fasteners or banded. Minimum compression is to be used to assure firm fit and still maintain thermal performance.
- Vapor retarders should overlap a minimum of 2" (51 mm) at all seams, and be sealed with appropriate pressure sensitive tape or mastic. When applying pressure sensitive tapes, the tape must be firmly rubbed with a proper sealing tool to make sure the closure is secure. Follow tape manufacturer's recommendations.
- Fasteners shall be located a maximum of 3" (76 mm) from each edge and spaced 12"–16" (305–406 mm) on center.
- Where vapor retarder performance is necessary, all penetrations and facing damage shall be repaired with tapes or mastic with a minimum of 2" (51 mm) overlap. Tapes should be applied using a sealing tool and moving pressure. Use on ducts, plenums, vessels, tanks and equipment operating at temperatures of 450° F (232° C) or less.
- Tapes and mastics (dry) should have a UL 723 rating of 25 flame spread, 50 smoke developed.

Ducts and Plenums

- Use of 3.0 PCF (48 kg/m^3) insulation board in concealed areas is recommended.
- Use of 6.0 PCF (96 kg/m^3) insulation board in exposed areas and outdoor applications is recommended.

Vessels, Tanks and Equipment

- For irregular surfaces, use 1.6 PCF (26 kg/m^3) insulation board and band with minimum compression.
- For outdoor application, Earthwool Insulation Board must be covered with appropriate jacketing, mastic or other vapor retarder. All exposed surfaces must be protected.
- Apply jacketing, mastics and other vapor retarders in accordance with manufacturer's instructions.

Precaution

- During initial heat-up to operating temperatures above 350° F (177° C), a slight odor and some smoke may be given off as a portion of the bonding material used in the insulation begins to undergo a controlled decomposition.
- If natural convection is not adequate in confined areas, forced ventilation should be provided in order to protect against any harmful fumes and vapors that might be generated.

PACKAGING

Vacuum packaging this product will reduce some mechanical properties of the insulation. By ordering vacuum packaged products, the customer acknowledges these reduced properties and assumes responsibility for the fitness for use in their application.

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.

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.

KNAUF INSULATION, INC.
One Knauf Drive
Shelbyville, IN 46176

Technical Support
(317) 398-4434 ext. 8727
info.us@knaufinsulation.com

01-24

FASSON® 0828

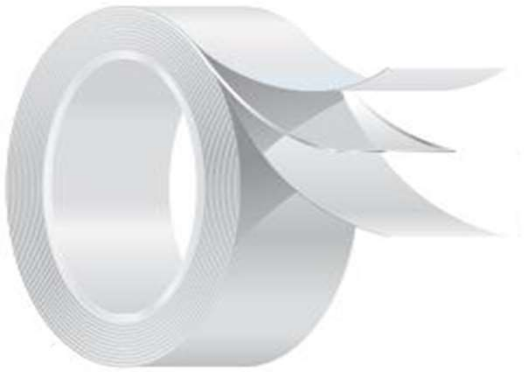
Avery Dennison FASSON® 0828 is suitable for die-cut shapes, shielding, moisture and vapor barrier sealing components or lamination to insulation materials.

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 CDPH Standard Method V1.2
- 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
- CDPH V1.2 recognized by USGBC LEED, WELL building standard, ANSI/GBI 01-2019, and more
- High-strength reinforced FSK reinforces seal and is decaBDE free
- Application temperature as low as 0ºF
- Made in the USA



CONSTRUCTION:

Liner:
60# White Kraft

Adhesive:
COLD TOUGH® Acrylic

Carrier:
Tri-directional FSK Foil Laminate

	General Use Tape Surface Burning Characteristcs to	
UL 723	**Flame Spread**	**10**
722S	**Smoke Developed**	**15**

FASSON® 0828

Adhesive Properties:		Typical Values		
Thickness	ASTM D3652	**US Mils**	**MM's**	**Micron's (µm)**
Liner		3.5	0.09	89
Adhesive		1.7	0.04	43
Carrier		8.0	0.20	203
Total Caliper without Liner:		9.7	0.25	246
Total Caliper:		13.2	0.34	335

Peel Adhesion	ASTM D3330		
180° 12 in (300 mm) min @ Room Temp			
Substrate		**Lbf / in**	**N / Meter**
SS	INITIAL	6.5	1,145

Static Shear	ASTM D3564		
180° 1" sq (6.5 cm2) 2500 g @ Room Temp			
Substrate		**Min to Fail**	
SS	INITIAL	> 10000	

Tensile	ASTM D882		
180° 2 in (50.8 mm) / min @ Break @ Room Temp			
Substrate		**Lbf / in**	**N / Meter**
Product	MD	40	7,044
Product	CD	25.0	4,403

TLMI Release			
		Gf / 2 in w	
Product	INITIAL	40.0	

VOC			
VOC		**mg / m³**	
Product		< 0.5	

TEMPERATURES	**° F**	**° C**
Minimum Application Temperature	0° F	-18° C
Maximum Continuous Operating Temperature	200° F	93° C
Maximum Intermittent Operating Temperature	250° F	120° 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 64-72ºF (18-22ºC) / 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.

AVERY DENNISON | Performance Tapes

Asia Pacific
Kunshan, China,
NO. 618 Nanhe Road
Kunshan Economic &
Technological Zone
China, 215335
+86 512 57155001
Fax: +86 512 57155059

Europe
Tieblokkenlaan 1
B-2300 Turnhout
Belgium
+32 (0)14 40 48 11
Fax: +32 (0)14 40 48 55

North America
250 Chester Street
Painesville, Ohio
44077 USA
+1 866-462-8379
Fax: +1 888-358-4469

ALUMAGUARD® All-Weather Flexible Weather-Proofing Jacket

Alumaguard® ***All-Weather*** weather-proofing cladding from ***Polyguard Products*** is the only flexible insulation cladding available in the market which combines the self-healing characteristics of rubberized asphalt with the ease of application and cold weather performance of acrylic adhesive-based products.

- Proven: Uses the same outer layer and rubberized asphalt compound as the original ***Alumaguard*** membrane which has been used successfully in the market for 12 years. True Zero Perm Performance
- Self-Healing: rubberized bituminous membrane seals small cuts and punctures; aluminum is UV stable.
- Acrylic adhesive allows installation down to 10ºF.
- No pinning or activator required
- Excellent emissivity
- Can be used year round
- Available in bright white ***Alumaguard® Cool Wrap*** finish which meets California Title 24, CRRC and Energy Star requirements.

Description

Alumaguard All-Weather is a composite membrane consisting of a multi-ply embossed UV-resistant aluminum foil/polymer laminate to which is applied a layer of rubberized asphalt specially formulated for use on insulated duct and piping applications. A metalized polyester film coated with a high quality low temperature acrylic adhesive is then applied to the rubberized asphalt. A heavy duty release liner gives ***Alumaguard All-Weather*** its peel and stick functionality.

Uses

Alumaguard® All-Weather is designed to be used outdoors to weather-proof exterior insulated ductwork, piping or other insulated tanks, vessels and equipment. ***Alumaguard All-Weather*** resists moisture, air and vapor intrusion.

Notes: Prior to the installation of *Alumaguard All-Weather*, ducts must be sealed in accordance with SMACNA HVAC Duct Construction Standards Metal and Flexible, 3rd Edition (2005), Seal Class A.

Installation

All roof-top ductwork to which *Alumaguard All-Weather* is to be applied must be designed with adequate slope (watershed) to prevent ponding water. Ponding water is defined as water that stays in place for greater than 24 hours.

P.O. Box 755
Ennis, TX 75120
PH: (214) 515-5000
FX: (972) 875-9425

***Alumaguard All-Weather* is typically applied to faced fiberglass board, rigid isocyanurate foam board with facing, or unfaced extruded polystyrene foam board.**

***Alumaguard All-Weather* products are most commonly applied over rigid insulation on outdoor piping and ductwork systems. However, *Alumaguard All-Weather* products may be applied to clean and dry bare metal ducts. Care must be taken at terminations and where ducts attach to supports to make sure water entry is not allowed. All published application recommendations must be followed.**

Applying *Alumaguard All-Weather* to light density duct wrap is not recommended. Round or oval duct should be insulated with 3# or 6# pipe and tank wrap with appropriate facing.

Alumaguard All-Weather is a "peel and stick" product which must be applied to a properly prepared substrate. In duct applications, ***Alumaguard All-Weather*** can be used for the underside of the duct and does not require pinning. Complete installation instructions are available on our website, www.polyguardproducts.com.

Packaging
Alumaguard All-Weather is available in 4" x 75' and 35" x 75' rolls packaged 12 and 1 to a carton respectively in an embossed foil finish.

Limited Warranty
Polyguard Products warrants material to be free from leaks caused by defects in materials or manufacturing for a period of ten (10) years from the date of installation when material is applied according to installation instructions in effect at the time of installation. Contact ***Polyguard*** for complete details on the Limited Warranty.

Limitations
Alumaguard®All-Weather should be installed on a properly prepared, clean and dry substrate. ***Alumaguard All-Weather*** must be protected from damaging chemicals including petroleum and/or coal tar solvents.

Alumaguard All-Weather should not be adhered directly to commercial roofing membranes. For specific information regarding ***Alumaguard All-Weather*** and commercial roofing, refer to Technical Bulletin, 2011-1.

Alumaguard All-Weather should be stored in a clean dry area with boxes laid horizontally and not on end. The product has a recommended shelf life of 12 months.

Note: Before installing *Alumaguard® All-Weather*, please obtain a full set of our most current installation instructions on our website, or call *Polyguard* at 214-515-5000.

Alumaguard® All-Weather Technical Properties and Testing		
Membrane Property	**Test Method**	**Results**
Product Thickness (w/o liner)	Micrometer	34 mils 37 (Cool Wrap)
Product Weight	Scale	0.2 lbs/sf
Water Vapor Transmission (grains/hr-ft²)	ASTM E96-00	.00
Permeance (US Perms)	ASTM E96-00	.00
Peel Adhesion (to primed steel)	ASTM D1000	>16 lbs/in
Elongation at Break	PSTC 131	164%
Tensile Strength	PSTC 131	50 lb/in
Puncture Resistance (Film Only)	ASTM D1000	15 lbs/in
Mold Resistance	ASTM C1338	Pass
Upper Temperature Limit	LAB	150ºF
Emissivity	ASTM C1371	.030
***Alumaguard® Cool Wrap* Properties and Test Results**	**Solar Reflectance**	**Thermal Emittance**
Cool Roof Rating Council(CRRC) Initial	0.86	0.82
Cool Roof Rating Council(CRRC) 3 Year	0.77	0.86
Energy Star 3 Year	0.84	0.78
California Title 24	Exceeds 0.75	Exceeds 0.75