Pro Insulation

4414 South 16th Street
Ft. Smith, AR 72901
Ph. 479-646-5644
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January 22, 2025

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

Mr. Jon Davis

Re: Mechanical Insulation Submittals for Goodwill, Little Rock, Arkansas.

No Spec section.

The following items will be insulated with Knauf Earthwool pipe insulation with ASJ + vapor barrier jacket. All fittings will receive an additional PVC fitting cover.

Item #1 Domestic Cold Water---------- 1" Thick

Item #2 Domestic Hot Water---------- 1" Thick

Thank You,

Mike Galatzer

DATA SHEET

Earthwool® 1000° Pipe Insulation

with ECOSE® Technology

DESCRIPTION

Earthwool 1000° Pipe Insulation is a molded, one-piece insulation made from highly resilient, inorganic glass fibers bonded with ECOSE Technology.

APPLICATION

- Iron, copper, stainless steel, PVC, and CPVC piping
- Hot, cold, concealed and exposed piping systems operating at temperatures 0° F-1000° F (-18° C to 538° C)
- Additional weather protection is needed for outdoors use

SPECIFICATION COMPLIANCE

U.S.

- ASTM C547; Type I, Type IV
- ASTM C585
- ASTM C1136 (jacket); Type I, II, III, IV, VII, VIII, X
- NFPA 90A and 90B
- Conformity for fit Marine Equipment IMO 1408
- MIL-DTL-32585; Type 1, Form 4, Facing A and D
- USCG 164.109/4/1
- UL/ULC Classified
- Listed and Labeled Pipe Insulation by Underwriter Laboratories (UL) File No. R8583, Category: Insulated Plastic Pipe Assemblies (BSMP) for installation over PVC, Polypropylene, and CPVC meeting “FHC 25/50” with minimum 1 inch insulation thickness.
- ASTM C795, MIL-I-24244, NRC Reg. Guide 1.36 (Certification needs to be specified at time of order)

Canada

- CAN/ULC S102
- CGSB 51-GP-9M
- CGSB 51-GP-52M (jacket)
- CAN/CGSB-51.9 (obsolete, replaced by ASTM C547)

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 and gives the product its unique appearance.

All of our products are formaldehyde-free and 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

TECHNICAL DATA		
Property (Unit)	**Test**	**Performance**
Corrosiveness	ASTM C665	Does not accelerate corrosion of steel
Corrosion	ASTM C1617	Pass
Maximum Service Temperature	ASTM C411 + ASTM C447	1000° F (538° C)
Water Vapor Permeance	ASTM E96, Procedure A	0.01 perms or less
Water Vapor Sorption (by weight)	ASTM C1104	Less than 5%
Shrinkage	ASTM C356	Negligible
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

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

PRODUCT FORMS AND SIZES

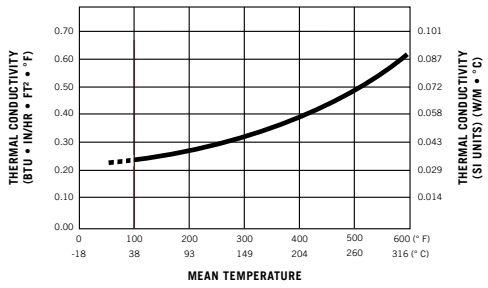
- Produced in 3' (914 mm) sections
- For iron pipe ½" – 24" (15 mm – 610 mm) nominal pipe size
- For copper tube ⅝" – 6⅛" (16 mm – 156 mm)
- All insulation inner and outer diameters comply with ASTM C585
- Wall thicknesses from ½" to 6" (13 mm to 152 mm) in single layer for most sizes
- With or without a white, factory-applied jacket, ASJ+ (all-service jacket) is composed of aluminum foil, reinforced with a glass scrim bonded to a kraft paper interleaving with an outer film layer leaving no paper exposed.
- A matching ASJ+ butt strip is supplied for each section
- The longitudinal lap of the jacket has the SSL+ self-sealing lap that creates a strong and lasting bond

Packaging

- Four carton sizes for easy ordering, inventory tracking and storage
- Reinforced carton handles for strength and easy lifting
- Bar-coded cartons for accurate shipments and tracking
- Full product range stocked at distributors for fast availability

THERMAL CONDUCTIVITY | ASTM C335

Mean Temperature	k	k (SI)
75° F (24° C)	0.23	0.033
100° F (38° C)	0.24	0.035
200° F (93° C)	0.28	0.040
300° F (149° C)	0.34	0.049
400° F (204° C)	0.42	0.061
500° F (260° C)	0.51	0.074
600° F (316° C)	0.62	0.089



ASHRAE 90.1-2016 REQUIREMENTS

MINIMUM PIPE INSULATION THICKNESS

Fluid Operating Temperature Range and Usage	Insulation Conductivity		Nominal Pipe or Tube Size				
	Conductivity Range BTU-in./(hr · ft² · °F)	Mean Temperature Rating	<1"	1"–<1½"	1½"–<4"	4"–<8"	≥8"
Heating and Hot Water Systems (Steam, Steam Condensate, Hot-Water Heating and Domestic Water Systems)[a, b, c, d]							
Above 350° F	0.32–0.34	250° F	4½"	5"	5"	5"	5"
251–350° F	0.29–0.31	200° F	3"	4"	4½"	4½"	4½"
201–250° F	0.27–0.30	150° F	2½"	2½"	2½"	3"	3"
141–200° F	0.25–0.29	125° F	1½"	1½"	2"	2"	2"
105–140° F	0.22–0.28	100° F	1"	1"	1½"	1½"	1½"
Cooling Systems (Chilled Water, Brine, Refrigerant)[a, b, c, d]							
40–60° F	0.21–0.27	75° F	½"	½"	1"	1"	1"
Below 40° F	0.20–0.26	50° F	½"	1"	1"	1"	1½"

a. For insulation outside the stated conductivity range, the minimum thickness (T) shall be determined as follows: $T=r\{(1+t/r)^{K/k}-1\}$, where T=minimum insulation thickness (in.), r=actual outside radius of pipe (in.), t=insulation thickness listed in this table for applicable fluid temperature and pipe size, K=conductivity of alternate material at mean rating temperature indicated for the applicable fluid temperature {Btu · in.(h · ft² · °F)}; and k=the upper value of the conductivity range listed in this table for the applicable fluid temperature.

b. These thicknesses are based on energy efficiency considerations only.

c. For piping smaller than 1½" and located in partitions within conditioned spaces, reduction of these thicknesses by 1" shall be permitted (before thickness adjustment required in footnote a) but not to thicknesses below 1". These thicknesses are based on energy efficiency considerations only. Issues such as water vapor permeability or surface condensation sometimes require vapor retarders or additional insulation.

d. The table is based on steel pipe. Non-metallic pipes schedule 80 thickness or less shall use the table values. For other non-metallic pipes having thermal resistance greater than that of steel pipe, reduced insulation thicknesses are permitted if documentation is provided showing that the pipe with the proposed insulation has no more heat transfer per foot than a steel pipe of the same size with the insulation thickness shown on the table.

PRECAUTIONS

Hot Pipe

- May be installed while the system is in operation, at all temperatures up to 1000° F (538° C).
- Knauf Insulation recommends, for insulation thicknesses greater than 6" (152 mm), the temperature must be increased from 500° F (260° C) to maximum temperature at a rate not exceeding 100° F (37.8° C) per hour.
- 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.
- Care must also be taken when using sealants, solvents or flammable adhesive during installation.
- A maximum of 6" (152 mm) wall thickness is recommended.

Cold Pipe

- Use a continuous vapor retarder on piping operating below ambient temperatures.
- Seal all joints, surfaces, seams and fittings to prevent condensation.
- On below freezing applications, and in high-abuse areas, the ASJ+ jacket shall be protected with a PVC vapor retarding outer jacket. In addition, exposed ends of insulation shall be sealed with vapor barrier mastic installed per the mastic manufacturer's instructions. Vapor seals at butt joints shall be applied at 12' to 21' intervals; at the Engineer's discretion and at each fitting to isolate any water incursion.
- On chilled water systems operating in high humidity conditions, it is recommended that the same guidelines be followed as listed above for below freezing applications.
- Exterior hanger supports are recommended.

Outside Application

- Do not expose pipe insulation to weather. It must be covered with appropriate jacketing, mastic or vapor retardant coatings.
- All exposed surfaces must be protected. Proto® Indoor/Outdoor PVC Jacketing is recommended. See Knauf Insulation Guide Specifications for recommended PVC jacketing application guidelines.
- Apply jacketing, mastics or vapor retardant adhesives per manufacturer's instructions.
- For metallic jackets, factory-applied moisture retarders are recommended.

ASJ+ SSL+

- Keep adhesive and contact surfaces free from dirt and water. Seal immediately once adhesive is exposed.
- Apply when ambient and insulation temperatures are between 20° F and 130° F (-6.7° C and 54° C).
- If stored below 20° F or above 130° F, allow insulation cartons to stand within recommended temperature range for 24 hours prior to application.
- Do not store product below -20° F (-29° C) or above 150° F (66° C).
- When using Knauf Insulation's SSL+ Advanced Closure System, make sure the longitudinal and circumferential joints are properly sealed by rubbing the closure firmly with a squeegee. Use of staples is not recommended.
- When using Earthwool® 1000° pipe insulation, the surface temperature of the ASJ+ facing should not exceed 150° F (66° C).

Fittings and Hangers

- Use Proto 25/50 Rated (ASTM E84) PVC Fitting Covers, applying PVC fittings per Proto's Data Sheet.
- Fittings should be insulated to same thickness as the adjoining insulation.
- Apply fittings per manufacturer's instructions.
- When required by specification, a hard insert of sufficient length should be used to avoid compression of the insulation.

APPLICATION GUIDELINES

Storage

- Protect insulation from water damage or other abuse, welding sparks and open flame.
- Cartons are not designed for outside storage.

Preparation

- Apply only on clean, dry surfaces
- Pipe or vessel should be tested and released before insulation is applied.

General Guidelines

- All sections should be firmly butted.
- Seal circumferential joint with a minimum 3" (76 mm) wide butt strip.
- Jackets, coating and adhesives should have a comparable F.H.C. rating.
- ASJ+ may be painted. As with traditional ASJ, Knauf Insulation does not encourage the painting of ASJ+ because the application of any paint may change the surface burning characteristics and will void the UL Classification and Knauf Insulation Limited Warranty.

Insulation Limited Warranty

- Where painting is necessary, use common water, oil, or solvent-based paints. All paints should be tested for compatibility and adhesion before use.
- All piping should have continuous insulation.
- Position longitudinal lap downward to avoid dirt and moisture infiltration.
- Do not expose pipe insulation to excessive vibration or physical abuse.
- Faced insulation should not have a facing temperature above 150° F (66° C).

SSL+ Installation Instructions:

- To install SSL+, first remove the kraft release liner to expose adhesive.
- Carefully align the jacketing. Starting in the center of the insulation section, begin initial SSL+ tack using pressure in the direction of the overlap. Again, starting in the center of the insulation section, with a plastic squeegee begin to apply firm pressure to the bonded lap area swiping from the center of the insulation section toward each end.
- **Note:** After initial SSL+ adhesive tack, it is critical that the closure is not re-opened and repositioned on the facing. Doing so will delaminate the jacket and adhesive, diminishing the bond strength.

Butt Strip Installation Instructions:

- To install Butt Strips, remove the kraft release liner by separating the butt strip from the kraft using the convenient, easy release kiss cut.
- Simply wrap the butt strip, centered around the joint, and apply firm pressure with a squeegee.
- **Note:** After initial Butt Strip adhesive tack, it is critical that the closure is not re-opened and repositioned on the facing. Doing so will weaken the adhesive and diminish bond strength.

Recommended Thicknesses (ASHRAE 90.1-2016)

The minimum thicknesses are based on ASHRAE 90.1-2016 standards and do not necessarily represent the Economic Thickness of Insulation or the thickness required for proper condensation control. Rather, they serve as minimum recommendations for commercial applications. For recommended Economic Thickness, install according to Knauf Insulation or NAIMA 3E Plus programs or as specified.

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.

CERTIFICATIONS

Insulated Plastic Pipe Assemblies BSMP.R8583

FHC 25/50

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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12-21

25/50 Smoke-Safe™ PVC

specification data

The Speedline® Smoke Safe™ PVC Insulated Fitting Covering System consists of preformed gloss white outdoor weatherable and gloss colored insulated covers for piping fittings. Their unique shapes fit screwed, Victaulic®, welded and flanged elbows, tees, valves, couplings, laterals, reducers and endcaps.

The Speedline® Smoke Safe™ PVC Jacketing System consists of gloss white outdoor weatherable and colored PVC sheet in either bulk rolls or precurled cut-to-fit pipe sizes. The White Jacketing is available in .010", .015", .020", and .030" thicknesses.

The Jacketing and Fitting Covering Systems include solvent weld adhesives, stainless steel tack fasteners, silicone caulking and adhesive tapes. A die-cut multi-temperature fiberglass insulation insert is available and sized for a full insulation over the exposed pipe fitting and under the overlay of the PVC Fitting Cover.

Specification Compliance

ASTM D 1784, Cell Class 16354,
Federal Specification HH-I-558, Form B,
Type 1 Class B (Insert Insulation)
USDA and FDA for use in food processing,
beverage, and pharmaceutical facilities
Military Spec LP-1035A, Type II Grade GU
Military Spec LP-535E, Type II Grade GU
New York City MEA 402-07-M,
Agriculture Canada, Canada: CGSB 51.53-95

Applications

Speedline® Smoke Safe™ PVC Insulated Fitting Covers and Jacketing are designed for indoor and outdoor* applications in commercial, institutional and industrial facilities.

- Speedline® Smoke Safe™ PVC Fitting Covers are designed to cover pipe fittings and other mechanical equipment with an outside diameter of 1-5/8" up to 24" in accordance with ASTM C-585. For outdoor use and in high abuse areas, .030 is recommended. For straight runs of piping, expansion joints should always be used to prevent product failure.
- Speedline® Smoke Safe™ PVC jacketing is suitable for covering all flat and round surfaces such as ductwork, tanks and other mechanical equipment. On vessels larger than 24" OD a minimum of .040 Jacketing should be used. For OD's larger than 48", Speedline flat jacketing is not recommended. Due to the expansion and contraction of tanks and vessels, expansion joints should always be used to prevent product failure.
- The Speedline® Smoke Safe™ PVC Jacketing System has an application temperature range of -35°F to 500°F (-37°C to 260°C). The PVC surface should remain below 150°F (66°C) through the installation of sufficient insulation on higher temperature applications.

- **Easy Installation - the unique shapes make an easy seal over an entire mechanical system**
- **Clean, neat and attractive appearance due to the high gloss PVC surface**
- **Low maintenance**
- **Corrosion resistance**
- **Outdoor weatherability* (UV stable)**
- **The 25/50 fire class of all Speedline® Smoke Safe™ products provides greater universal building code acceptance**
- **Provides a natural barrier to moisture, bacteria and mold**

**** Colored fitting covers and jacketing are NOT recommended for outdoor use.***

SPEEDLINE

Cleveland: 1 800 551 9759 | Greensboro: 1 800 551 9760
Stockton: 1 800 833 4500 | La Porte: 713 670 9700
www.speedlinepvc.com

25/50 Smoke-Safe™ PVC

specification data

Physical Properties

Property	Test Method	Value
Speedline® Smoke Safe™ PVC		
Flame Spread	ASTM E84	25 or less
Smoke Developed	ASTM E84	50 or less
Specific Gravity	ASTM 792	1.46
Tensile Strength @ yield lb./in.^{2}	ASTM D638	7,000
Tensile Modulus PSI	ASTM D638	400,000
Izod Impact- ft.lb./in.	ASTM D256	15.0
Permeance @ .030"	ASTM E96	.03
WVTR @ .030"	ASTM E96	.014
Permeance @ .020"	ASTM E96	.05
WVTR @ .020"	ASTM E96	.021
Electrical Conductance	ASTM D257	None
Fiberglass Insulation		
Flame Spread	ASTM E84	25 or less
Smoke Developed	ASTM E84	50 or less
Thermal Conductivity (75°F/24°C)	ASTM C177	0.26

Specification Data

Hot Systems

All piping fittings shall be insulated by filling the total void over all fittings, between straight runs of pipe insulation, with Speedline® die-cut fiberglass insulation, forming a uniform insulation thickness equal to or exceeding the adjacent pipe insulation. Finish all insulated pipe fittings by applying Speedline® Smoke Safe™ PVC Fitting Covers overlapping the adjacent pipe insulation outer covering. Secure the Speedline® Fitting Covers with Speedline® Stainless Steel Tack Fasteners, Speedline® PVC Tape or by welding PVC overlaps with Speedline® Solvent Weld Adhesive. Caution should be exercised to be sure that the insulation surface temperature is maintained below 150°F (66°C) through the application of sufficient insulation under all PVC Covering.

Cold Systems

All piping fittings shall be insulated by filling the total void over all pipe fittings between straight runs of pipe insulation with Speedline® die-cut fiberglass insulation, forming a uniform insulation thickness equal to, or exceeding, the adjacent pipe insulation. Finish all insulated pipe fittings by applying Speedline® Smoke Safe™ PVC Fitting Covers overlapping the adjacent pipe insulation outer covering. The overlap of the throat of the PVC Fitting Cover and the ends of the Fitting Cover overlapping the adjacent pipe insulation vapor barrier jacketing shall be vapor sealed with compatible vapor barrier mastic. The ends of the PVC Fitting Cover overlapping the adjacent pipe insulation shall be further sealed by an outer wrapping of Speedline® PVC Tape extending over the adjacent pipe insulation vapor barrier jacketing and overlapping its own circumferential juncture by at least two inches in the downward direction on the downward side.

Chemical Resistance

Inorganic Acids	
Sulfuric, nitric, hydrochloric, hydrofluoric (diluted or concentrated):	Excellent
Organic Acids	
Formic, acetic and propionic	Poor
Alkalies	
Sodium and potassium hydroxides	Excellent
Ammonium hydroxide	Excellent
Caustic Soda	Excellent
Soda Ash	Excellent
Miscellaneous Corrosive Chemicals	
Phenol, resorcinol and creosol	Poor
Iodine, crystals	Fair
Iodine, tincture	Excellent
Chlorine and bromine water	Excellent
Potassium dichromate	Excellent
Silver nitrate	Excellent
Tannic acid	Excellent
Solvent and Dilutents	
Alcohol and polyalcohols, including ethyl methanol, butanol and isopropyl alcohol	Excellent
Ketones	
Lower boiling ketones	Dissolves
Higher boiling ketones	Swells
Ethers	
Ethyl	Softens
Dichlorethyl ether	Swells
Diethyl cellosolve	Swells
Dioxane	Dissolves
Propylene oxide	Dissolves
Hydrocarbons	
Aromatics as gasoline, kerosene and petroleum oils	Excellent
Oils, Fats and Waxes	
Animal, mineral and vegetable	Excellent

FASSON® 0838

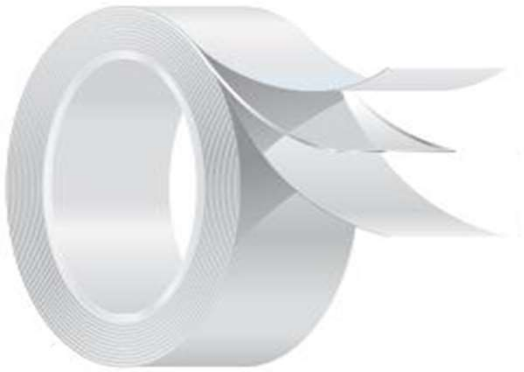
Avery Dennison FASSON® 0838 is a closure system tape with Lamtec ASJ 30J insulation facing.

FEATURES

- Specially formulated antimicrobial, extreme weather,COLD TOUGH® all weather acrylic adhesive
- Excellent initial tack and long-term adhesion
- Meets ASTM C-1136 Type I, Type II, Type III 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

- Excellent bond to Lamtec ASJ 30J insulation facing
- High-strength reinforced facestock reinforces seal and is decaBDE free
- CDPH V1.2 recognized by USGBC LEED, WELL building standard, ANSI/GBI 01-2019, and more
- For use with ASJ+ faced pipe insulation
- Application temperature as low as -18ºC / 0ºF
- Made in the USA



CONSTRUCTION:

Liner:
60# White Kraft

Adhesive:
COLD TOUGH® Acrylic

Carrier:
Foil Laminate

General Use Tape Surface Burning Characteristcs to

UL 723	**Flame Spread**	**20**
722S	**Smoke Developed**	**10**

FASSON® 0838

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		9.0	0.23	229
Total Caliper without Liner:		10.7	0.27	272
Total Caliper:		14.2	0.36	361

Peel Adhesion	ASTM D3330		
180° 12 in (300 mm) min @ Room Temp			
Substrate		**Lbf / in**	**N / Meter**
SS	INITIAL	4.8	845

Loop Tack	ASTM D6195		
180° 20 in (508 mm) / min @ Room Temp			
Substrate		**Lbf / in**	**N / Meter**
SS	INITIAL	6.0	1,057

Tensile	ASTM D882		
180° 2 in (50.8 mm) / min @ Break @ Room Temp			
Substrate		**Lbf / in**	**N / Meter**
Product	MD	55	9,686
Product	CD	50.0	8,805

TLMI Release			
		Gf / 2 in w	
Product	INITIAL	50.0	

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	275° F	135° 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

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January 22, 2025

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

Mr. Jon Davis

Re: Mechanical Insulation Submittals for Goodwill, Little Rock, Arkansas.

No Spec section.

The following items will be insulated with Armacell Armaflex black lap seal pipe cover. All joints and seams will be sealed with 520 adhesive.

Item #1 Condensate Drains---------- ½" Thick

Item #2 Refrigerant Suction---------- ¾" Thick

Thank You,

Mike Galatzer

SOLUTIONS FOR ENERGY SAVINGS

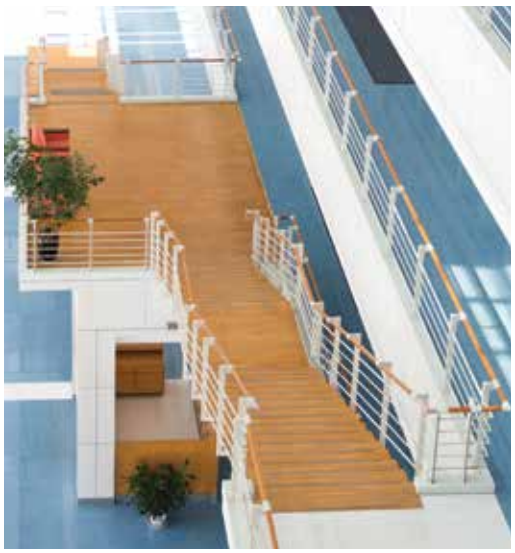
AP ArmaFlex®

Black Lap Seal

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

// 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

www.armacell.us



armacell®
ArmaFlex®

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. For use in commercial, industrial, and residential applications.

Specification Compliance

ASTM C 534, Type I – Grade 1 ASTM E 84	UL 723 NFPA 90A, 90B	UL 181 ASTM G21/C1338	ASTM D 1056, 2C1

Approvals, Certifications, Compliances

- 3rd party certified by FM Approvals through 1-1/2" wall thickness per FM 4924
- 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 certified.
- Plenum Rated
- Conforms to ASHRAE 90.1 Energy Standards
- Conforms to building codes: International Mechanical Code, IMC, International Energy Conservation Code, IECC, International Residential Code, IRC, Title 24 California Building Energy Efficiency Standards.

Typical Properties

Specifications	Values		Test Method
	3/8" through 1" Wall (NBR/PVC based)	**1-1/2" and 2" Walls** (EPDM based)	
Thermal Conductivity: Btu • in/h • ft2 • °F (W/mK)			
50°F Mean Temperature (10°C) 75°F Mean Temperature (24°C) 100°F Mean Temperature (38°C) 125°F Mean Temperature (52°C)	0.235 (0.034) 0.245 (0.0353) 0.257 (0.037) 0.268 (0.039)	0.278 (0.040) 0.28 (0.040) 0.289 (0.041) 0.300 (0.043)	ASTM C 177 or C 518
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, UL 723
Water Absorption, % by Volume:	0.2 %	0.2 %	ASTM C 209 or ASTM C1763
Mold Growth: **Fungi Resistance:**	Passed	Passed	UL181 ASTM G21/C1338
Maximum Service Temperature	220°F (105°C) ①	300°F (149°C) ②	ASTM C534
Minimum Service Temperature ③	-297°F (-183°C) ④	-297°F (-183°C) ④	ASTM C534

Sizes

Wall Thickness (nominal) Form	3/8", 1/2", 3/4" 1", 1-1/2", 2" (10, 13, 19, 25, 38, 50 mm)
Inside Diameter, Tubular Form	3/8" ID to 6" ID (10 mm to 153 mm) [3/8" and 1/2" IDs not offered in 3/8" wall thickness]
Length of Sections, Tubular Form	6' (1.8 m)

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 AP ArmaFlex BST Pipe Insulation can withstand temperatures as high as 250°F for 96 hour time periods when tested according to ASTM C411 - Standard Test Method for Hot-Surface Performance of High-Temperature Thermal Insulation.
② 1-1/2" and 2" AP ArmaFlex tubes are formulated with EPDM rubber giving them a higher upper use temperature than AP ArmaFlex tubes less than 1-1/2" wall thickness.
③ 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.
④ For applications of -40°F to -297°F (-40°C to -183°C), contact Armacell

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. Microban International, Ltd. makes neither direct nor implied health claims for the products containing Microban® antimicrobial product protection. Data, photomicrographs and information presented are based on standard laboratory tests and are provided for comparative purposes to substantiate antimicrobial activity for non-public health uses. Microban is a registered trademark of Microban International, Ltd.

AP ArmaFlex BLACK LAPSEAL TUBE INSULATION - R VALUES

3/8 " Walls

IPBST05838	1/2" Copper	2.6
IPBST03438	5/8" Copper	2.4
IPBST07838	3/4" Copper	2.4
IPBST11838	1" Copper	2.3
IPBST13838	1-1/4" Copper	2.2
IPBST15838	1-1/2" Copper	2.5
IPBST11038	1-1/2" IPS	2.4
IPBST21838	2" Copper	2.4

1/2 " WALLS

IPBST03812	1/4" Copper	3.3
IPBST01212	3/8" Copper	3.3
IPBST05812	1/2" Copper	3.4
IPBST03412	5/8" Copper	3.3
IPBST07812	3/4" Copper	3.3
IPBST11812	1" Copper	3.3
IPBST13812	1-1/4" Copper	3.2
IPBST15812	1-1/2" Copper	3.2
IPBST11012	1-1/2" IPS	3.1
IPBST21812	2" Copper	3.2
IPBST20012	2" IPS	3.2
IPBST25812	2-1/2" Copper	3.2
IPBST21012	2-1/2" IPS	3.2
IPBST31812	3" Copper	3.2
IPBST30012	3" IPS	3.1
IPBST35812	3-1/2" Copper	3.1
IPBST41812	4" Copper	3.1
IPBST40012	4" IPS	3.0

3/4 " WALLS

IPBST03834	1/4" Copper	5.9
IPBST01234	3/8" Copper	5.5
IPBST05834	1/2" Copper	5.6
IPBST03434	5/8" Copper	5.5
IPBST07834	3/4" Copper	5.4
IPBST11834	1" Copper	5.4
IPBST13834	1-1/4" Copper	5.3
IPBST15834	1-1/2" Copper	5.1
IPBST11034	1 1/2" IPS	4.9
IPBST21834	2" Copper	4.8
IPBST20034	2" IPS	5.2
IPBST25834	2-1/2" Copper	4.7
IPBST21034	2-1/2" IPS	5.0
IPBST31834	3 " Copper	4.6
IPBST30034	3" IPS	4.9
IPBST35834	3-1/2" Copper	4.5
IPBST41834	4" Copper	4.5
IPBST40034	4" IPS	4.8

1" WALLS

IPBST03810	1/4" Copper	7.3
IPBST01210	3/8" Copper	7.2
IPBST05810	1/2" Copper	7.2
IPBST03410	5/8" Copper	7.0
IPBST07810	3/4" Copper	7.0
IPBST11810	1" Copper	7.2
IPBST13810	1-1/4" Copper	7.2
IPBST15810	1-1/2" Copper	7.2
IPBST11010	1-1/2" IPS	6.9
IPBST21810	2" Copper	6.8
IPBST20010	2" IPS	7.1
IPBST25810	2-1/2" Copper	6.5
IPBST21010	2-1/2" IPS	6.8
IPBST31810	3" Copper	6.3
IPBST30010	3" IPS	6.6
IPBST35810	3-1/2" Copper	6.2
IPBST41810	4" Copper	6.1
IPBST40010	4" IPS	6.4
IPBST50010	5 " IPS	6.2
IPBST60010	6 " IPS	6.1

1-1/2" WALLS

IPBST03815	1/4" Copper	13.7
IPBST01215	3/8" Copper	12.7
IPBST05815	1/2" Copper	12.0
IPBST03415	5/8" Copper	11.3
IPBST07815	3/4" Copper	10.8
IPBST11815	1" Copper	10.1
IPBST13815	1-1/4" Copper	9.6
IPBST15815	1-1/2" Copper	9.2
IPBST11015	1-1/2" IPS	8.7
IPBST21815	2" Copper	8.6
IPBST20015	2" IPS	8.8
IPBST25815	2-1/2" Copper	8.2
IPBST21015	2-1/2" IPS	8.4
IPBST31815	3" Copper	7.9
IPBST30015	3" IPS	8.1
IPBST35815	3-1/2" Copper	7.7
IPBST41815	4" Copper	7.5
IPBST40015	4" IPS	7.8
IPBST50015	5" IPS	7.5
IPBST60015	6" IPS	7.3

2" WALLS

IPBST03820	1/4" Copper	19.7
IPBST01220	3/8" Copper	18.2
IPBST05820	1/2" Copper	17.2
IPBST03420	5/8" Copper	16.2
IPBST07820	3/4" Copper	15.5
IPBST11820	1" Copper	14.5
IPBST13820	1-1/4" Copper	13.7
IPBST15820	1-1/2" Copper	13.1
IPBST11020	1-1/2" IPS	12.4
IPBST21820	2" Copper	12.2
IPBST20020	2" IPS	12.3
IPBST25820	2-1/2" Copper	11.6
IPBST21020	2-1/2" IPS	11.7
IPBST31820	3" Copper	11.1
IPBST30020	3" IPS	11.2
IPBST35820	3-1/2" Copper	10.7
IPBST41820	4" Copper	10.5
IPBST40020	4" IPS	10.7
IPBST50020	5" IPS	10.2
IPBST60020	6" IPS	9.9

* These specifications are based on the measurement methods employed by Armacell. Other methods may not result in the same values and cannot be used to determine if the product is within the given tolerance.

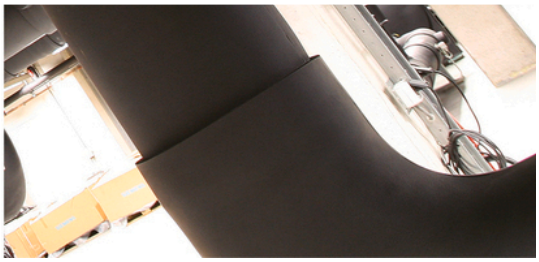
AP ArmaFlex | Black LapSeal Tube TDS | 112021 | NA| EN-A | 020

ABOUT ARMACELL

As the inventors of flexible foam for equipment insulation and a leading provider of engineered foams, Armacell develops innovative and safe thermal, acoustic and mechanical solutions that create sustainable value for its customers. Armacell's products significantly contribute to global energy efficiency making a difference around the world every day. With 3,000 employees and 23 production plants in 15 countries, the company operates two main businesses, Advanced Insulation and Engineered Foams. Armacell focuses on insulation materials for technical equipment, high-performance foams for high-tech and lightweight applications and next generation aerogel blanket technology.

For more information, please visit:
www.armacell.us
800-866-5638

armacell®
ArmaFlex®



SOLUTIONS FOR ENERGY SAVINGS

ArmaFlex
520 Adhesive

An air-drying contact adhesive specifically designed for use with ArmaFlex insulation products.

// The original contact adhesive for ArmaFlex insulation
// Years of on-the-job performance
// Meets MIL-A-24179A and Amend-2

armacell®
ArmaFlex®

TECHNICAL DATA - ARMAFLEX 520 ADHESIVE

Brief description	A special air-drying contact adhesive that is required for joining the seams and butt joints of ArmaFlex Pipe and Sheet Insulations as well as adhering ArmaFlex to ducts, tanks, chillers and other equipment / vessels.
Material type	Synthetic rubber base with synthetic resins and fillers added; hydrocarbon- and ketone-type solvents.
Product color range	Greenish yellow
Product range	Half-pint and pint brush-top cans and pint, quart, and gallon containers.

Approvals and compliance

Specification compliance	• All Armacell facilities in North America are ISO 9001 certified.	• ASTM G21/C1338	• MIL-A-24179A Type II, Class 1

Property	Value / Assessment				Standard / Test method
Temperature range					
Service temperature	Min. °C	Min. °F	Max. °C	Max. °F	
	-50	-58	120	250	
	Remarks	120 °C (250 °F) — ArmaFlex pipe insulation seams and joints 82 °C (180 °F) — Full bonding sheet insulation For applications below -50°C (-58°F), contact Armacell technical team.			
Fire Performance and Approvals					
Surface burning characteristics[1]	Flame spread and smoke development index: 25/50 rated				ASTM E84
Health and environment					
Volatile organic compounds (VOC) content	615 g/l				
Other technical features					
Bond time	Immediate after allowing for tack time.				
Cure time	36 hours				
Shelf life	1-1/2 years in original sealed container.				
Solids content	Approximately 19% by weight.				
Storage	Store in a well ventilated area with storage temperature 60° F to 80° F (16° C to 27° C).				
Tack time	1–5 minutes depending on ambient conditions.				
Wet flash point	-15°F (-26°C) (TOC).				
Yield	200 sq ft per gallon (18.5 m²/gallon or 5 m²/l) max, single coat (depending upon porosity of materials bonded and air temperature).				

[1] ASTM E84 performance is for adhesive in the dry state.

Adhesive and cleaner | ArmaFlex 520 Adhesive (AMERICAS) | TDS | 032024 | en-US

ABOUT ARMACELL

As the inventor of flexible foam for equipment insulation and a leading provider of engineered foams, Armacell develops innovative and safe thermal and mechanical solutions that create sustainable value for its customers. Armacell's products significantly contribute to global energy efficiency making a difference around the world every day. With more than 3,300 employees and 25 production plants in 19 countries, the company operates two main businesses, Advanced Insulation and Engineered Foams. Armacell focuses on insulation materials for technical equipment, high-performance foams for acoustic and lightweight applications, recycled PET products, next-generation aerogel technology and passive fire protection systems.

armacell®
ArmaFlex®

For more information, please visit:
www.armacell.com

Pro Insulation

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

January 22, 2025

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

Mr. Jon Davis

Re: Mechanical Insulation Submittals for Goodwill, Little Rock, Arkansas.

No Spec section.

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

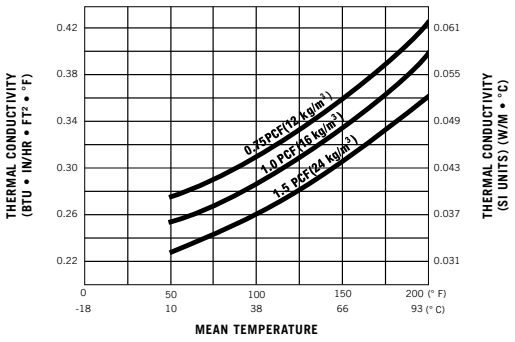
Fiberglass insulation will not sustain mold growth. However, mold can grow on almost any material when it becomes wet and contaminated. Carefully inspect any insulation that has been exposed to water. If it shows any sign of mold, it must be discarded. If the material is wet but shows no evidence of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

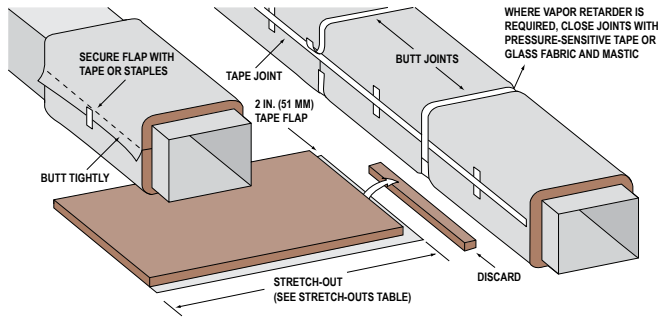
Application

- 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

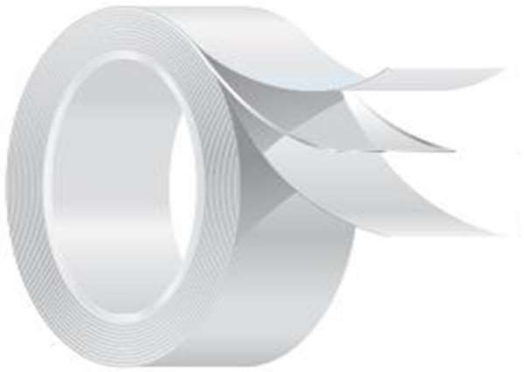
Avery Dennison FASSON® 0828 is suitable for die-cut shapes, shielding, moisture and vapor barrier sealing components or lamination to insulation materials.

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.

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