Quality People. Building Solutions.

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Date: 8/21/2025
Return Request: 9/4/2025
Project: Hot Springs National Park – Rehabilitate Bathhouses – Buckstaff Bathhouse
Supplier: Coleman Industrial Construction
Manufacturer: Varies
Submittal: HVAC Piping Insulation
Submittal Number: 230719.001
Spec Section: 230719
Drawing # and Installation Location: M3-1 through M3-4, and M4-1

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September 8, 2025

Comfort Systems
9924 Landers Rd
North Little Rock, AR 72117

Mr. Joe Loomis

Mechanical Insulation Submittal for **Buckstaff Bathhouse Renovation** in Hot Springs, AR

Specification# 23 07 19 HVAC Piping Insulation

The following items will be insulated with Johns Manville pipe insulation with ASJ+ vapor barrier jacket. All fittings will have an additional PVC fitting cover.

Item# 1: Chilled Water ----------1-1/4" Pipe & Smaller----------1" Thick
----------1-1/2" & larger----------1-1/2" Thick

Item# 2: Heating Water ----------1-1/4" Pipe & Smaller----------1-1/2" Thick
----------1-1/2" & Larger----------2" Thick

Item# 3: Condensate Drains----------1/2" Thick

The following items will be insulated with Armacell Armaflex pipe insulation. All joints will be sealed with Armacell 520 adhesive. All exterior piping to receive an additional .016" thick embossed aluminum jacket.

Item# 1: Refrigerant Low Pressure Suction----------1" Thick

Item# 2: Refrigerant Liquid ----------1-1/2" Thick

Thank you,

Melissa Miller
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MECHANICAL INSULATION

MICRO-LOK® *HP* ULTRA

HIGH-PERFORMANCE FIBERGLASS PIPE INSULATION

DATA SHEET

DESCRIPTION

Micro-Lok® *HP* Ultra fiberglass pipe insulation is a high-performance pipe insulation with a polypropylene-coated factory-applied vapor-barrier jacket. Micro-Lok *HP* Ultra is made from biosoluble glass fibers bonded with a thermosetting resin and produced in 36" (0.92 m) lengths and is used to insulate standard iron pipe, plastic pipe and copper tubing. The polypropylene-coated jacket includes a longitudinal, self-sealing closure lap and matching butt strip. The jacket system is adhered to each fiberglass section using a specially formulated adhesive to ensure jacket securement.

The factory-installed tape system permits installation at ambient temperatures down to 20°F (-7°C) and will not soften or separate when exposed to high ambient temperatures and humidity.

USES

Micro-Lok *HP* Ultra fiberglass pipe insulation is suitable for installation over hot, cold, concealed and exposed piping systems with operating temperatures up to 850°F (454°C). Weather-protective jacketing is required for outdoor applications. Pipe operating below ambient temperature requires all joints to be sealed with factory-applied, self-seal lap and butt strips. Micro-Lok *HP* Ultra is UL listed and labeled over plastic pipes for air plenum applications when used at 1.0" thickness or greater.

The jacketed insulation can also resist temporary exposure to small amounts of liquid water as long as the exposed fiberglass ends have been vapor-sealed. This may potentially allow contractors to install the insulation earlier on a jobsite – before the building envelope has been enclosed. Micro-Lok *HP* Ultra's jacket is cleanable by wiping it down using a soft, damp cloth. Micro-Lok *HP* Ultra is intended for indoor use. Outdoor use of Micro-Lok *HP* Ultra requires separate weather protection.

PHYSICAL PROPERTIES

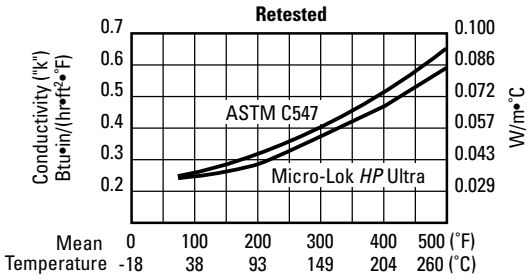
Service Temp. Range (ASTM C411)	0°F to 850°F (-18°C to 454°C)
Moisture Sorption	<5% by weight
Corrosivity (ASTM C1617)	<5 ppm chloride standard
Shrinkage (ASTM C356)	None
Microbial Growth (ASTM C1338)	Does not promote microbial growth
Surface Burning Characteristics	Composite FHC 25/50 per ASTM E84, NFPA 255, CAN/ULC S102.2
Limited Combustibility	NFPA 90A and 90B
Jacketing (Poly ASJ)	ASTM C1136 (Type I, II, VII, & X)
Water Vapor Permeance (ASTM E96 – Procedure A)	0.01 perms max.
Bursting Strength (ASTM D774)	100 psi (8.7 kg/cm^2)
Tensile Strength (ASTM D828)	75 lbs./in. (13.1 N/mm) width min. (MD) 60 lbs./in. (10.5 N/mm) width min. (CD)

SPECIFICATION COMPLIANCE

- ASTM C547 Type I (Replaced HH-I-558B, Form D, Type III, Class 12, Class 13 up to 850°F (454°C))
- ASTM C585 – Dimension Standard for pipe ID only
- ASTM C1136 (Jacketing) (Replaces HH-B-100B, Type I & II)
- MIL-DTL-32585 Type 1, Form 4, Facing A (unjacketed only)
- MIL-I-22344D, MIL-PRF-22344E
- Coast Guard/IMO Approved 164.109/56/0 (plain, unjacketed only – excluding 7/8 x ½ [22 mm x 13 mm], ½ x ½ [13 mm x 13 mm])
- Bureau of Household Goods and Services CA-T1039 (CO)
- Firestop Assemblies: Meets requirement for jacketed fiberglass pipe insulation product at or above 3.5 pcf.
- ASTM E84, CAN/UL-S102.2 – 25/50 listed and labeled Intertek testing laboratories, listed and labeled Underwriter Laboratories
- ASTM D2863 – Limiting Oxygen Index (LOI) minimum 31
- NRC 1.36, ASTM C795, MIL-I-24244C, MIL-DTL-24244D*

*When ordering material to comply with ASTM C795, NRC 1.36 & MIL-I-24244 a statement of that fact must appear on the purchase order. Specific lot testing will be conducted and a certification of compliance can be provided.

THERMAL CONDUCTIVITY ("K") *



Mean Temperature	°F	75	100	200	300	400	500
	°C	24	38	93	149	204	260
Btu•in/(hr•ft²•°F)		0.23	0.24	0.28	0.34	0.44	0.55
W/m•°C		0.034	0.035	0.040	0.049	0.063	0.079

*Apparent thermal conductivity values are determined by applying procedures dictated per ASTM C1045 on test data obtained using ASTM Test Method C335. All values are based on nominal manufacturing and testing parameters, are subject to normal variation, and are not guaranteed for specification purposes or otherwise.

SUSTAINABLE BUILDING ATTRIBUTES

Manufacturing Location	Defiance, Ohio (43512)	
Recycled Content (glass only)	41%	
Recycled Content (total product)	28%	
Volatile Organic Compounds (ASTM D5116) (Analysis ASTM D6196 & ASTM D5197)	Total	0.15 g/l
Fiberglass Pipe Insulation	Formaldehyde Aldehydes	0.009 ppm 0.009 ppm
Volatile Organic Compounds (Calculated)	Total	<49 g/l
Self-Sealing Lap & Butt Strips		

SUSTAINABLE BUILDING CERTIFICATIONS

GREENGUARD® GREENGUARD® GOLD	Certified Certified
LEED® Credits LEED-NC	To see LEED info call technical support.

GREENGUARD PRODUCT CERTIFIED FOR LOW CHEMICAL EMISSIONS UL.COM/GG UL 2818 GOLD

CERTIFIED RECYCLED CONTENT SCS GLOBAL SERVICES AVERAGE 32% RECYCLED CONTENT POST-CONSUMER

Intertek

CLASSIFIED UL Insulated Plastic Pipe Assemblies (BSMP)

MICRO-LOK® *HP* ULTRA

HIGH-PERFORMANCE FIBERGLASS PIPE INSULATION

DATA SHEET

SIZE AVAILABILITY

Insulation Thickness		Iron Pipe Size Range		Copper Tubing Size Range	
in.	mm	in.	mm	in.	mm
½	13	½–6	13–152	⅝–4⅛[§]	16–105
1	25	½–24	13–610	⅝–6⅛	16–156
1½	38	½–24	13–610	⅝–6⅛	16–156
2	51	½–24	13–610	1⅛–6⅛	29–156
2½	64	1–24	25–610	1⅜–6⅛	35–156
3	76	1–24	25–610	1⅜–6⅛	35–156
3½	89	1½–24[*]	38–610	–	–
4	102	3–24[**]	76–610	–	–
4½	114	3–24[†]	76–610	–	–
5	127	3–20[††]	76–508	–	–

Notes:

[*] 2½" and 23" IPS not available in this insulation thickness.

[**] 22" and 23" IPS not available in this insulation thickness.

[†] 21", 22" and 23" IPS not available in this insulation thickness.

[††] 19" IPS not available in this insulation thickness.

[§] 3⅝" CTS not available in this insulation thickness.

ACOUSTIC - INSERTION LOSS

Insertion loss data for Johns Manville pipe insulation acoustic treatments tested per ASTM E1222

Frequency	1-in Micro-Lok HP Ultra	1-in Micro-Lok HP Ultra with Zeston PVC (20 mil)	1-in Micro-Lok HP Ultra with MLV (1 psf)	2-in Micro-Lok HP Ultra	2-in Micro-Lok HP Ultra with Zeston PVC (20 mil)	2-in Micro-Lok HP Ultra with MLV (1 psf)
Hz	dB	dB	dB	dB	dB	dB
315	2	1	10	1	0	12
400	2	4	13	0	8	17
500	3	5	14	1	10	19
630	5	11	21	6	14	21
800	7	13	20	8	15	22
1000	9	19	25	13	20	29
1250	10	20	28	14	22	31
1600	13	24	33	17	26	37
2000	15	27	35	20	29	39
2500	17	29	36	21	30	38
3150	19	30	36	23	32	40
4000	20	29	36	26	34	41
5000	22	30	36	29	34	38

ACOUSTIC - TRANSMISSION LOSS

Transmission loss data and sound transmission class (STC) for Johns Manville pipe insulation acoustic treatments tested per ASTM E90

Frequency	1-in Micro-Lok HP Ultra	1-in Micro-Lok HP Ultra with Zeston PVC (20 mil)	1-in Micro-Lok HP Ultra with MLV (1 psf)	2-in Micro-Lok HP Ultra	2-in Micro-Lok HP Ultra with Zeston PVC (20 mil)	2-in Micro-Lok HP Ultra with MLV (1 psf)
Hz	dB	dB	dB	dB	dB	dB
125	4	7	15	6	8	15
250	4	7	18	6	8	20
500	4	11	23	7	15	29
1000	7	19	32	12	25	38
2000	14	25	38	20	32	45
4000	21	29	44	30	38	51
STC	8	16	28	12	19	31

In lab tests Johns Manville Ultra jacketing performed similarly to ASJ jacketing.

MICRO-LOK® *HP* ULTRA

HIGH-PERFORMANCE FIBERGLASS PIPE INSULATION

DATA SHEET

QUALIFICATIONS FOR USE

A sufficient thickness of insulation must be used to keep the maximum surface temperature of Micro-Lok *HP* Ultra below 150°F (66°C). In addition, at operating temperatures above 500°F (260°C), Micro-Lok *HP* Ultra pipe insulation must be applied in a thickness ranging from 2" (51 mm) minimum to 6" (152 mm) maximum.

During initial heat-up to operating temperatures above 350°F (177°C), an acrid odor and some smoke may be given off as the organic binders used in the fiberglass pipe insulation begin to decompose. When this occurs, caution should be exercised to ventilate the area well. This loss of binder does not directly affect the thermal performance of the pipe insulation, but the compressive strength and resiliency of the product are reduced. For applications with excessive physical abuse or vibration at high temperatures, consult your local Insulation Systems Market Development Manager for alternate material recommendations.

CHILLED WATER SYSTEMS

For chilled water systems, see 3-Part Specification, Mech-261.

APPLICATION RECOMMENDATIONS*

Micro-Lok *HP* Ultra Pipe Insulation and Butt Strips

1. Do not apply Micro-Lok *HP* Ultra if air temperature is below 20°F (-7°C) or above 130°F (54°C) due to the effect of temperature on tape performance. We recommend stapling when application falls outside this temperature range.

   When stapling, we recommend mastic be applied over staples to prevent moisture penetration.

2. If stored below 20°F (-7°C) or above 130°F (54°C), insulation cartons should stand within the recommended temperature range for 24 hours prior to application.

3. Once release paper is removed, both adhesive and lap must be kept free of dirt and water, and the lap sealed immediately.

4. When adhered, the lap and butt strips must be pressurized by rubbing firmly with a plastic squeegee or the back of a knife blade to ensure positive closure.

5. Do not reseal the lap or butt strip once applied. This could compromise the quality of the sealed jacket system.

**For complete application recommendations and installation instructions, see MECH-261 InsulSpec Specifications.*

Johns Manville
717 17th St.
Denver, CO 80202
800-654-3103
www.JM.com

North American Sales Offices, Insulation Systems

Eastern Region and Canada
P.O. Box 158
Defiance, OH 43512
800-334-2399
Fax: 419-784-7866

Western Region
P.O. Box 5108
Denver, CO 80217
800-368-4431
Fax: 303-978-4661

Technical specifications as shown in this literature are intended to be used as general guidelines only. Please refer to the Safety Data Sheet and product label prior to using this product. The physical and chemical properties of Micro-Lok *HP* Ultra listed herein represent typical, average values obtained in accordance with accepted test methods and are subject to normal manufacturing variations. They are supplied as a technical service and are subject to change without notice. Any references to numerical flame spread or smoke developed ratings are not intended to reflect hazards presented by these or any other materials under actual fire conditions. Check with your customer service representative for current information.

All Johns Manville products are sold subject to Johns Manville's standard Terms and Conditions, which includes a Limited Warranty and Limitation of Remedy. For a copy of the Johns Manville standard Terms and Conditions or for information on other Johns Manville thermal insulation and systems, visit www.jm.com/terms-conditions or call (800) 654-3103.

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English-US

Last Revision Date: June, 2021

Technical Data Sheet

3M™ Venture Tape™ Facing Tape 1540CW

Product Details

Regulatory Info/SDS

Product Description

3M™ Venture Tape™ 1540CW is a kraft/scrim/foil (ASJ) laminate coated with a cold weather acrylic pressure sensitive adhesive.

Product Features

- Cold weather adhesive performs well over a wide temperature range
- Mold inhibitor helps maintain adhesive strength and effectiveness
- High puncture and tear resistance ensures long life and durability.
- Conforms well to curved and irregular surfaces

Technical Information Note

The following technical information and data should be considered representative or typical only and should not be used for specification purposes.

Typical Physical Properties

Attribute Name	Test Method	Value
Color		White
Adhesive Type		Acrylic
Backing		ASJ
Backing Thickness	ASTM D3652	0.16 mm (6.5 mil)
Total Tape Thickness	ASTM D3652	0.19 mm (7.5 mil)
Liner		Release Liner
Water Vapor Transmission	ASTM E96	0.02 US Perms

Typical Performance Characteristics

Attribute Name	Test Method	Temperature	Value
180° Peel Adhesion	ASTM D3330	22 °C (72 °F)	Exceeds the strength o f tape backing oz/in [1]
Elongation at Break	ASTM D3759		2 %
Tensile Strength	ASTM D3759		70.1 N/cm (40 lb/in)

[1] 12 in/min (300 mm/min)

Attribute Name	Value
Long Term Temperature Resistance	116 °C (240 °F) [1]
Minimum Long Term Temperature Resistance	-40 °C (-40 °F) [1]

[1] Long Term (day, weeks)

Handling/Application Information

Application Examples

- Closure system on ASJ faced duct piping systems
- Vapor seal on ASJ faced ductboard and pipe insulation

Certifications/Standards

Certifications

- UL723 Classified (15/10 Flame/Smoke Rating) [UL file #R10984]
- CAN/ULC Classified (15/10 Flame/Smoke Rating) [UL file #R10984]

Codes & Test Standards

Meets ASTM C1136, Type 1, II, III, IV. *ASTM C1136 testing based in part on third party test data of the product backing

Storage and Shelf Life

Store under normal conditions of 4° to 27°C (40° to 80°F) and 40 to 50% relative humidity in the original packaging, out of direct sunlight. For best performance, use this product within 18 months from date of manufacture.

Information

Technical Information: The technical information, guidance, and other statements contained in this document or otherwise provided by 3M are based upon records, tests, or experience that 3M believes to be reliable, but the accuracy, completeness, and representative nature of such information is not guaranteed. Such information is intended for people with knowledge and technical skills sufficient to assess and apply their own informed judgment to the information. No license under any 3M or third party intellectual property rights is granted or implied with this information.

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ISO Statement

This product was manufactured under a 3M quality system registered to ISO 9001 standards.

3M™ Industrial Specialties Division
3M Center, St. Paul, MN 55144-1000
www.3M.com

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Childers®

Mastics, Coatings, Adhesives, Sealants

CP-33 CHIL-OUT™
Vapor Retarder Coating
Product Data Sheet

INDOOR & OUTDOOR
WATER-BASED, VAPOR RETARDER COATING

DESCRIPTION
CP-33 is a water-based, vapor retarder coating for insulation on interior, exterior, low temperature, some dual temperature applications (such as chilled water and refrigerated pipe lines), HVAC ducts and low temperature equipment. It is fast drying and forms a tough, flexible dry film which protects insulated surfaces and helps retard the flow of vapor through an insulation system. It has a smooth, creamy consistency that spreads easily and can be applied in a relatively heavy coating or brushed out into a thin, smooth film.

USES
CP-33 can be used on most types of thermal insulations in both cold and dual temperature service. It is used to vapor seal the seams, overlaps and punctures from pins and staples in FSK, ASJ, white paper and polyester vapor retarder facings on insulation boards, duct wrap and pipe covering. It may also be used to seal cut ends of insulation to prevent moisture ingress and fiber release. It is compatible with fiber glass, mineral fiber, cellular glass, polyisocyanurate, polyurethane, polystyrene, phenolic, rubber foam and other insulations.

APPLICATION
CP-33 features easy application by trowel or brush. It may be applied with CHIL-GLAS® #10 Glass Fiber Reinforcing Mesh to increase film strength. See reverse side of product data sheet for application information.

ADVANTAGES
- Water-based for personal and environmental safety.
- Fast-drying contributes to maximum production rates.
- Non-flammable – safe for transport, storage and usage.
- Quick and efficient cleanup of tools and metal with warm water before coating completely dries.
- Outdoor rated and UV resistant.

CERTIFIED
- MAS Certified Green®
- California Dept. of Public Health Standard Method v1.2
- VOC Emissions and Content requirements to contribute to **LEED v4** EQ Credit: Low Emitting Materials – Paints and Coatings
- VOC Content: 49 g/l, less water and exempt solvents
- Collaborative for High Performance Schools EQ 7.1
- Meets NFPA Standard 90A and 90B 25/50 requirements as a closure mastic

COLOR
White

AVERAGE WET WEIGHT (ASTM D1475)
11.9 lbs./U.S. gal. (1.4 kg/liter)

AVERAGE NON-VOLATILE (ASTM D2369)
55% by volume (68.5% by weight)

SERVICE TEMPERATURE RANGE
Temperature to which dry film is subjected.
-20°F to 190°F (-29°C to 88°C)

APPLICATION & STORAGE TEMPERATURE RANGE
40°F to 100°F (4°C to 38°C)

DRYING TIME
Temperature, humidity and film thickness will affect drying time.
To Touch: 3 Hours
Through: 24 Hours

COVERAGE
Varies with substrate and membrane.
4 U.S. gal./100 sq. ft. (1.6 l/m^2)

CLEAN UP
Warm, soapy water while coating is still wet.

WATER VAPOR PERMEANCE (TYPICAL AVERAGE)
Tested with reinforcing mesh.

ASTM F1249: 0.15 perms (0.10 metric perms) at 28 – 53 mils (1.1 – 1.27 mm) dry film thickness. Tested at 73°F, 50% RH.

ASTM E96, PROCEDURE A: 0.15 perms (0.10 metric perms) at 50 mils (1.25 mm) dry film thickness.

Meets the permeance requirements of ASTM C755-19, Section 7.2.2 for below ambient vapor retarder coatings when used as a closure mastic in conjunction with ASJ and other vapor retarder membranes.

SURFACE BURNING CHARACTERISTICS (ASTM E84)
Flame Spread: 5
Smoke Developed: 15
Tested as applied in a 4 in. strip at a rate of 25 sq. ft./U.S. gallon to inorganic reinforced cement board.

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H.B. Fuller Construction Products Inc.

Customer Service
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1105 South Frontenac Street
Aurora, IL 60504

Fax
800-952-2368

Suggested Specifications Childers® CHIL-OUT™ CP-33

To seal seams, overlaps, punctures, penetrations and terminations of vapor retarder membrane jacketing:

CP-33 Vapor Retarder Coating shall be applied with a first tack coat applied at a coverage rate of 2 U.S. gals./100 sq. ft. (0.8 l/m^2). While still wet, a layer of CHIL-GLAS® #10 Glass Fiber Reinforcing Mesh shall be embedded, with all seams overlapped a minimum of 2" (5.08 cm). A finish coat at a coverage rate of 2 U.S. gals./100 sq. ft. (0.8 l/m^2) shall be applied so that the total wet film thickness is a minimum of 0.064". This will provide a minimum dry film thickness of 0.035".

NOTES TO SPECIFYING ENGINEER

1. CP-33 Vapor Retarder Coating, white, should be specified where white All Service Jacketing (ASJ), or other white coatings/finishes are specified on the adjoining pipe or equipment insulation.
2. CHIL-BYL® CP-76 or CHIL-JOINT® CP-70 Joint Sealant is recommended for use with CP-33 Vapor Retarder Coating. Confirm compatibility of joint sealant with insulation before choosing.
3. Do not use over copper clad wire.
4. All outdoor horizontal surfaces must be sloped at least 1/2 inch per foot to assure water run-off and prevent the ponding of rain water and melting snow or ice.

Application Guide and Suggested Procedures

1. USE OF MATERIAL

DO NOT THIN. Store the product in a warm and dry area. Protect from freezing until dry.

It is essential in applying vapor retarder sealing materials that the recommended film thickness be achieved. Therefore, do not try to spread the vapor retarder coating too thin.

2. THE CONDITION OF THE INSULATION TO BE COATED

Since CP-33 is a vapor retarder, it should never be applied over insulation containing moisture. Dusty or porous substrates should first be primed with CHIL-SEAL® CP-50A MV1, diluted 50% with water for proper bonding. Allow the primer to thoroughly dry before over-coating with CP-33 Vapor Retarder Coating.

3. HINTS FOR SUCCESS

A vapor retarder system is no better than its weakest link. It is extremely important that where the finish terminates at an uninsulated point, the finish of CP-33 Vapor Retarder Coating and glass fiber reinforcing mesh be flashed over the uninsulated section for a minimum of 4" (10.16 cm).

Where there is a possibility of the temperature of the uninsulated section exceeding 190°F (88°C) due to steam-off or other heated application, the vapor sealing at this joint shall be accomplished by using CHIL-BYL® CP-76 Joint Sealant.

The surface of extruded polystyrene and polyisocyanurate board stock may contain water-soluble inks that may bleed through water-based mastics. Test before applying CP-33 Vapor Retarder Coating.

CUSTOMER SERVICE: (800) 832-9002

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ADEQUATE TESTS: The information contained herein we believe is correct to the best of our knowledge and tests. The recommendations and suggestions herein are made without guarantee or representation as to results. We recommend that adequate tests be performed by you to determine if this product meets all of your requirements. The warranted shelf life of our products is twelve months from date of shipment to the original purchaser or as otherwise provided on the certificate of analysis.

For professional use only. Keep out of reach of children.

Consult Safety Data Sheet and container label for further information.

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.

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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:
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SOLUTIONS FOR ENERGY SAVINGS

ArmaFlex®

520 Adhesive

A air-drying contact adhesive specifically designed for use with ArmaFlex Insulation Products.

// Formulated for ArmaFlex Insulations
// Air-drying contact adhesive
// Years of on-the-job performance
// Meets MIL-A-24179A and Amend-2

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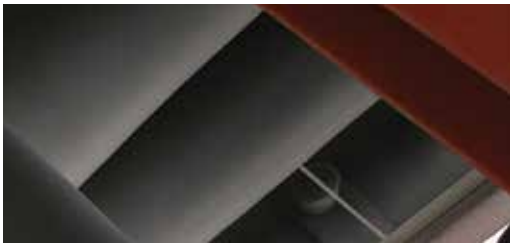

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ArmaFlex®

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.

Specification Compliance

MIL-A-24179A Type II, Class 1	ASTM G21/C1338

Approvals, Certifications, Compliances

- All Armacell facilities in North America are ISO 9001 certified.

Typical Properties

Specifications	Values	
Color	Greenish yellow	
Net Weight	6.9 pounds per gallon (828 g/l)	
Composition	Synthetic rubber base with synthetic resins and fillers added; hydrocarbon- and ketone-type solvents.	
Volatile Organic Compounds (VOC) Content	615 g/l	
Solids Content	Approximately 19% by weight	
Coverage	200 sq ft (5 m^2/l) per gallon max, single coat (depending upon porosity of materials bonded and air temperature)	
Shelf Life	1-1/2 years in original sealed container; Store in a well ventilated area with storage temperature 60° F to 80° F (16° C to 27° C).	
Maximum Service Temperature	250°F (120°C) — ArmaFlex Pipe Insulation seams and joints 180°F (82°C) — Full bonding sheet insulation	
Minimum Service Temperature[1]	-58° F (-50 °C)	
Tack Time	1–5 minutes depending on ambient conditions	
Bond Time	Immediate	
Full Cure Time	36 hours	
Container Sizes	Half-pint and pint brush-top cans and pint, quart, and gallon containers	
Wet Flash Point	-15 °F (-26 °C) [TOC]	
Flame Spread and Smoke Developed Index	25/50 rated	ASTM E 84

[1] For applications of below -58°F (-50°C), contact Armacell technical team.

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ArmaFlex | 520 Adhesive TDS | 112022 | NA| EN-A | 083

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 3,100 employees and 26 production plants in 18 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:
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JM ALUMINUM ROLL AND SHEET

ALUMINUM METAL JACKETING/CLADDING

DESCRIPTION

JM Aluminum Jacketing is the premier protective outer surface for mechanical insulation systems including pipe, vessels, and equipment. It protects the insulation and underlying pipe/vessel from physical damage, UV exposure, corrosive atmospheres, and water.

JM Aluminum jacketing (also called cladding) is available in smooth, stucco embossed, and 3/16 corrugated (cross-crimped) finishes. For larger surfaces, box-rib and deep corrugated sheets are also available.

JM Aluminum Jacketing has a bare outer surface and comes standard with a 3-mil thick polyfilm moisture barrier heat-laminated to the interior surface to help prevent corrosion of the jacketing and the underlying metal pipe, vessel, or equipment.

COMPOSITION

Commercially pure aluminum is relatively soft and less suited for use in this application. Its strength can be greatly improved by alloying with small percentages of one or more other elements such as manganese, silicon, copper, zinc, and magnesium. Additional strength can be achieved by cold working. JM carefully screens all potential aluminum coil suppliers to assure our products have the highest quality, are corrosion resistant, and comply with all relevant standards.

JM Aluminum Jacketing is typically manufactured using alloys 3105 or 3003 which have very similar composition and performance and are considered interchangeable for use as insulation jacketing. JM reserves the right to ship whichever alloy is in stock at the time of order placement. One of these two specific alloys or an alternative alloy can be specified by purchaser at time of order placement but this may affect minimum quantity, lead-time, and price.

Composition Differences in Aluminum Alloys (%)

Alloy	Cu	Mn	Mg	Zn
3105	≤ 0.3	0.3-0.8	0.2-0.8	≤ 0.4
3003	0.05-0.2	1-1.5	---	≤ 0.1

COMPLIANCE TO STANDARDS

All bare and polyfilm lined JM Aluminum Jacketing complies with the requirements of ASTM C1729 (Aluminum Jacketing Material Standard) which includes the strength and chemical composition requirements for compliance to ASTM B209 (Aluminum Alloy Standard).

RECOMMENDED USES

Aluminum Jacketing is recommended for use in all of the following insulation system applications:

- Standard outdoor use on all pipe, vertical tank insulation systems up to 8 ft outer diameter, and all horizontal tanks
- Indoor insulation system applications up to 8 ft outer diameter where increased damage resistance is desired

LIMITATIONS ON USE

Aluminum Jacketing is not appropriate for the following applications:

- For vertical tank insulation system applications where the outer diameter is larger than 8 ft, JM deep corrugated aluminum sheets should be used
- Where increased emissivity is desired, painted aluminum jacketing should be considered
- For applications where a maximum resistance to fire is required, stainless steel jacketing should be used
- For applications where additional resistance to corrosion from the external environment is required, JM painted aluminum jacketing may be used. Where maximum resistance to corrosion is required, JM stainless steel jacketing (T304 or T316) should be used.

POLYFILM MOISTURE BARRIER

Polyfilm Moisture Barrier (PFMB) is an engineered three layer coextruded film of polyethylene and Surlyn* polymers with a total film thickness of 3 mils (76 µm) that is heat laminated in the factory to the interior surface of aluminum jacketing. JM recommends the use of PFMB on all aluminum jacketing to help prevent pitting, crevice, and galvanic corrosion of the interior surface of the metal jacketing and the insulated pipe, tank, or equipment.

Due to its superior performance characteristics, PFMB replaces the old moisture barrier technology of 1 to 3 mil thick polykraft

*Surlyn is a trademark of DuPont

JM ALUMINUM ROLL AND SHEET

ALUMINUM METAL JACKETING/CLADDING

RECOMMENDED THICKNESS

JM recommends that the thickness of aluminum jacketing used vary based on the outer diameter of the insulation system per the requirements of ASTM C1729. This recommended thickness is shown in the table below.

EMITTANCE

JM Aluminum Jacketing has an outer surface emittance per ASTM C1371 and specified by ASTM C1729 of:

- Bare aluminum (oxidized in service) = 0.1

SURFACE FINISHES

Each of the three surface finishes available for JM Aluminum Jacketing (smooth, stucco embossed, and 3/16" corrugated has applications where it is recommended. All of these can be supplied with a painted exterior. For more information on this, consult the JM data sheet on painted aluminum jacketing.

Smooth (Plain Mill) Finish

This is a very popular finish and is the "default" for the many end-users/specifiers who prefer the clean look of this finish. This finish sheds rain water the best. However, this smooth surface readily shows damage such as from hail or other physical abuse. It is also shows the dirt more than the other finishes due to its smoothness. Lastly, it is highly reflective of sunlight and when located near roadways, some specifiers see this reflection as a possible safety hazard.

Stucco Embossed Finish

This is another popular finish used for aluminum jacketing. The stucco-like surface texture hides small imperfections and scratches caused by physical damage during or after installation. This finish also reduces reflectivity while still looking very professional. Lastly, the use of stucco embossed finish provides a small increase to the rigidity and strength of the aluminum jacketing.

3/16" Corrugated (Cross-Crimped) Finish

This finish consists of parallel grooves or crimps about 3/16" apart running in the length direction of the pipe. This finish also hides small damage and scratches to the jacketing and reduces sunlight reflection. In addition, the nature of this finish gives the aluminum jacket more ability to expand and contract to adapt to insulation movement caused by pipe or ambient temperature changes. Lastly, the rigidity and strength of 3/16" corrugated finish is substantially increased making it ideal for use as jacketing on large diameter pipe and vessels up to 8 ft diameter. This finish is available in a maximum thickness of 0.024 inches.

FLAMMABILITY

JM Aluminum Jacketing with a 3 mil polysurlyn moisture barrier has been tested for flammability using the industry standard ASTM E84 test method. The results were:
ASTM E84 Flame Spread Index: 0
ASTM E84 Smoke Developed Index: 5

(Tested with exterior metal surface exposed to the flame)

Outer Insulation Diameter (in)	**Minimum Aluminum Jacket Thickness, inches (mm)**	
	Rigid Insulation	Non-Rigid Insulation
≤ 8	0.016 (0.41)	0.016 (0.41)
Over 8 thru 11	0.016 (0.41)	0.020 (0.51)
Over 11 thru 24	0.016 (0.41)	0.024 (0.61)
Over 24 thru 36	0.020 (0.51)	0.032 (0.81)
>36	0.024 (0.61)	0.040 (1.01)

Formerly Pabco/Childers Metals

Johns Manville

717 17th St.
Denver, CO 80202
(800) 866-3234
JM.com

Technical specifications as shown in this literature are intended to be used as general guidelines only. Please refer to the Safety Data Sheet and product label prior to using this product. The physical and chemical properties of the product listed herein represent typical, average values obtained in accordance with accepted test methods and are subject to normal manufacturing variations. They are supplied as a technical service and are subject to change without notice. Any references to numerical flame spread or smoke developed ratings are not intended to reflect hazards presented by these or any other materials under actual fire conditions. Check with the Regional Sales Office nearest you for current information.

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05/11/20 (Replaces ACCS-05/07/2020)

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ELL-JACS™ PLUS

POLYFILM LINED ALUMINUM ELBOW COVERS

DATA SHEET

DESCRIPTION

JM Polyfilm lined Aluminum Elbow Covers are made in two precision formed matching halves to cover and weatherproof insulated 45° and 90° pipe elbows. These elbow covers are called Ell-Jacs™ Plus by JM.

Like JM Aluminum Jacketing, Ell-Jacs™ Plus are a premier protective outer surface for insulation systems on pipe and are an excellent performing and critical accessory to complement the aluminum jacketing. Ell-Jacs™ Plus protect the insulation and underlying pipe from physical damage, UV exposure, corrosive atmospheres, and water. They also reduce the time and labor needed to install the metal jacketing system.

Ell-Jacs™ Plus have a 3 mil (76 micron) three-layer Polyfilm Moisture Barrier (PFMB) that is factory heat laminated to the interior surface. When coupled with the ultrapure 1100 alloy used in these elbows, this moisture barrier reduces pitting/crevice and galvanic corrosion potential of the interior surface of the elbow cover and the underlying pipe.

Ell-Jacs™ Plus have a factory applied and baked on finish of highly durable hard film clear epoxy, acrylic, or polyester paint on the exterior surface to help resist external corrosion and to raise the emittance. The special paint used on the exterior surface of Ell-Jacs™ Plus is chalk and fade resistant. It exhibits better resistance to oxidation and to the effects of various corrosive environments than bare aluminum jacketing. This painted surface also resists water, scratching, and fingerprint staining.

See the JM Polyfilm Technical Data Sheet for more information on this material.

ADVANTAGES

Ell-Jacs™ Plus provide key advantages over aluminum elbows with a painted moisture barrier:

- PFMB on the interior surface reduces corrosion propensity – three layers of film in the PFMB eliminate pinholes
- Allows for the presence of PFMB on all parts of the metal jacketing system
- Increased spacing between fingers/ribs, for easier banding in the middle of the elbow
- PFMB has a very low water vapor transmission rate, further reducing corrosion potential
- Tough and strong PFMB film to resist damage during handling and installation. Painted moisture barrier is more easily scratched
- Clear exterior coating helps resist unsightly metal scratches

INNOVATIVE PRODUCT

Using JM's innovation process, our team has developed an improved product that will enhance the performance of the overall insulation system.

Ell-Jacs™ Plus will benefit the facility owner and specifier, as the optimum performing PFMB is now available for the first time as a complete system without having to utilize gore sections on the elbows.

COMPOSITION

Ell-Jacs™ Plus are made from the commercially pure (>99% aluminum) and highly corrosion resistant 1100 aluminum alloy.

The performance of even commercially pure aluminum can be improved by alloying with small percentages of one or more other elements such as silicon, iron, copper, manganese, and zinc. JM carefully screens all potential aluminum coil suppliers to assure our products have the highest quality, are corrosion resistant, and comply with all relevant standards.

COMPOSITION OF ALUMINIUM 1100 ALLOY (MAX %)

Alloy	Si+Fe	Cu	Mn	Zn
1100	0.95	0.05-0.20	0.05	0.1

See the JM PFMB vs. Polykraft or Paint Data Sheet for more detailed information regarding key benefits of PFMB compared to painted moisture barrier.

SIZE SELECTION AND INSTALLATION

For details on Ell-Jacs™ Plus sizes, their fit on insulation, and installation, see the JM data sheet on Aluminum Elbow Sizes and Installation.

ELL-JACS PLUS

POLYFILM LINED ALUMINIUM ELBOW COVERS

FIT

Ell-Jacs™ Plus are available to fit:

- 45° and 90° pipe elbows
- Long and short radius pipe elbows
- Butt weld, socket weld, and screwed elbows
- Insulated pipe from ½" to 12" NPS1

1Ell-Jacs™ Plus are available as quad sections for some insulation thicknesses at NPS > 12". Not all combinations of NPS and insulation thickness are available. See your JM sales representative for details.

THICKNESS

Ell-Jacs™ Plus are 0.024" (0.6 mm) in thickness to allow the elbows to be formed in the press. This thickness has proven acceptable in a vast number of installations and is adequate since elbows do not get the same abuse as straight jacketing and do not get walked on or ladders leaned on them.

RECOMMENDED USES

Ell-Jacs™ Plus are recommended for use anywhere aluminum jacketing is used on the associated straight sections of pipe but are especially critical when the straight pipe aluminum jacketing uses PFMB.

LIMITATIONS ON USE

Ell-Jacs™ Plus are not appropriate for the following applications:

- For applications where a maximum resistance to fire is required, JM stainless steel elbow covers should be used
- Where maximum resistance to exterior surface corrosion is required, JM stainless steel elbow covers should be used

EMITTANCE OF ALUMINUM ELBOWS

Ell-Jacs™ Plus have an outer surface emittance as measured by ASTM C1371 and specified by ASTM C1729 of:

- Standard clear coated = 0.5
- Bare aluminum (oxidized in service) for comparison = 0.1

FLAMMABILITY

Ell-Jacs™ Plus have been tested for flammability via the commonly used ASTM E84 test method. The results are shown below.

ASTM E84 Flame Spread Index = 0
ASTM E84 Smoke Developed Index = 5
(Tested with exterior metal surface exposed to the flame)

SURFACE FINISHES

Due to the pressing process during elbow formation, Ell-Jacs™ Plus have a smooth clear coated finish.

COMPLIANCE TO STANDARDS

Ell-Jacs™ Plus from JM complies with the applicable requirements of ASTM C1729 (Aluminum Jacketing Material Standard), Type III, Grade 3, Class A, which includes the strength and chemical composition requirements for compliance to ASTM B209 (Aluminum Alloy Standard).

SEALING OF JOINTS

For best insulation system performance and resistance to water infiltration, JM recommends that all joints in Ell-Jacs™ Plus be sealed with an appropriate joint sealant. This should be applied between the overlapping pieces of metal in the joint and not as a caulking bead on the exterior lip of the joint.

Formerly Pabco/Childers Metals

Johns Manville

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Technical specifications as shown in this literature are intended to be used as general guidelines only. Please refer to the Safety Data Sheet and product label prior to using this product. The physical and chemical properties of the product listed herein represent typical, average values obtained in accordance with accepted test methods and are subject to normal manufacturing variations. They are supplied as a technical service and are subject to change without notice. Any references to numerical flame spread or smoke developed ratings are not intended to reflect hazards presented by these or any other materials under actual fire conditions. Check with the Regional Sales Office nearest you for current information.

All Johns Manville products are sold subject to Johns Manville's standard Terms and Conditions, which includes a Limited Warranty and Limitation of Remedy. For a copy of the Johns Manville standard Terms and Conditions or for information on other Johns Manville thermal insulation and systems, visit www.jm.com/terms-conditions or call (800)654-3103.

01/03/23 (Replaces PAEC-05/11/20)

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Technical Data Sheet

DOWSIL™ 732 Multi-Purpose Sealant

General purpose silicone adhesive/sealant (specified)

Features & Benefits

- One-part adhesive/sealant
- Cures at room temperature when exposed to moisture in the air
- Acetoxy cure system
- Non-sag, paste consistency
- Easy to apply
- Cures to a tough, flexible rubber
- Good adhesion to many substrates
- Stable and flexible from -60°C to +180°C (-76°F to +356°F), with short peaks up to +205°C (401°F)
- Black version: stable and flexible from -60°C to +205°C (-76°F to +401°F), with short peaks up to +230°C (446°F)
- Excellent dielectric properties
- Complies with MIL-A-46106
- Complies with FDA 177.2600
- Available in white, black, clear and aluminum

Applications

- General industrial sealing and bonding applications
- Complies with MIL-A-46106 and FDA 177.2600

Typical Properties

Specification Writers: These values are not intended for use in preparing specifications.

CTM[1]	ASTM[1]	Property	Unit	Result
		As Supplied		
0176		Appearance		Non-slump paste
		Color(s)		White, black, clear or aluminum
0364		Extrusion rate[2]	g/minute	350
0098		Skin-over time	minutes	7
0095		Tack-free time	minutes	20

1. CTM: Corporate Test Method, copies of CTMs are available on request.
   ASTM: American Society for Testing and Materials.
2. Extrusion rate: 3.2 mm orifice at 0.62 MPa.

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Typical Properties

CTM	ASTM	Property	Unit	Result
		Mechanical properties, cured 7 days in air at 25°C (77°F) and 50% relative humidity		
0097B	D1475	Specific gravity		1.04
0099	D2240	Durometer hardness, Shore A		25
0137A	D412	Tensile strength	MPa	2.3
0137A	D412	Elongation at break	%	540
0420		Volume coefficient of thermal expansion	1/K	1.12×10^{-3}
		Electrical properties, cured 7 days in air at 25°C (77°F) and 50% relative humidity		
0114	D149	Dielectric strength	kV/mm	21.6
0112	D150	Dielectric constant at 100 Hz/100 kHz		2.8
0112	D150	Dissipation factor at 100 Hz/100 kHz		0.0015
0112	D150	Volume resistivity	Ohm.cm	1.5×10^{15}

How to Use

Substrate Preparation

All surfaces must be clean and dry. Degrease and wash off any contaminants that could impair adhesion. Suitable solvents include isopropyl alcohol, acetone or methyl ethyl ketone.

Unprimed adhesion may be obtained on many substrates such as glass, metals and most common engineering plastics. Substrates to which good adhesion is normally not obtained include PTFE, polyethylene, polypropylene and related materials.

However, for maximum adhesion, the use of DOWSIL™ 1200 OS Primer is recommended. After solvent cleaning, a thin coat of DOWSIL™ 1200 OS Primer is applied by dipping, brushing or spraying. Allow primer to dry for 15 to 90 minutes at room temperature and a relative humidity of 50% or higher.

How to Apply

Apply DOWSIL™ 732 Multi-Purpose Sealant to one of the prepared surfaces, then quickly cover with the other substrate to be bonded.

On exposure to moisture, the freshly applied material will "skin-over". Any tooling should be completed before this skin forms. The surface is easily tooled with a spatula. The adhesive/sealant will be tack-free in less than 45 minutes.

Cure Time

After skin formation, cure continues inward from the surface. In 24 hours (at room temperature and 50% relative humidity) DOWSIL™ 732 Multi-Purpose Sealant will cure to a depth of about 3 mm. Very deep sections, especially when access to atmospheric moisture is restricted will take longer to cure completely. Cure time is extended at lower humidity levels.

Before handling and packaging bonded components, users are advised to wait a sufficiently long time to ensure that the integrity of the adhesive seal is not affected. This will depend on many factors and should be determined by the user for each specific application.

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Compatibility

DOWSIL™ 732 Multi-Purpose Sealant releases a small amount of acetic acid during cure. This may cause corrosion on some metallic parts or substrates, especially in direct contact or when the cure is carried out in a totally enclosed configuration which would not allow cure by-products to escape.

Handling Precautions

PRODUCT SAFETY INFORMATION REQUIRED FOR SAFE USE IS NOT INCLUDED IN THIS DOCUMENT. BEFORE HANDLING, READ PRODUCT AND SAFETY DATA SHEETS AND CONTAINER LABELS FOR SAFE USE, PHYSICAL AND HEALTH HAZARD INFORMATION. THE SAFETY DATA SHEET IS AVAILABLE ON THE DOW WEBSITE AT DOW.COM, OR FROM YOUR DOW SALES APPLICATION ENGINEER, OR DISTRIBUTOR, OR BY CALLING DOW CUSTOMER SERVICE.

Usable Life and Storage

Product should be stored at or below 32°C (90°F) in original, unopened containers.

As DOWSIL™ 732 Multi-Purpose Sealant cures by reaction with moisture in air, keep the container tightly sealed when not in use. A plug of used material may form in the tip of a tube or cartridge during storage. This is easily removed and does not affect the remaining contents.

Limitations

This product is neither tested nor represented as suitable for medical or pharmaceutical uses.

Health and Environmental Information

To support customers in their product safety needs, Dow has an extensive Product Stewardship organization and a team of product safety and regulatory compliance specialists available in each area.

For further information, please see our website, dow.com or consult your local Dow representative.

Disposal Considerations

Dispose in accordance with all local, state (provincial) and federal regulations. Empty containers may contain hazardous residues. This material and its container must be disposed in a safe and legal manner.

It is the user's responsibility to verify that treatment and disposal procedures comply with local, state (provincial) and federal regulations. Contact your Dow Technical Representative for more information.

Product Stewardship

Dow has a fundamental concern for all who make, distribute, and use its products, and for the environment in which we live. This concern is the basis for our product stewardship philosophy by which we assess the safety, health, and environmental information on our products and then take appropriate steps to protect employee and public health and our environment. The success of our product stewardship program rests with each and every individual involved with Dow products - from the initial concept and research, to manufacture, use, sale, disposal, and recycle of each product.

Customer Notice

Dow strongly encourages its customers to review both their manufacturing processes and their applications of Dow products from the standpoint of human health and environmental quality to ensure that Dow products are not used in ways for which they are not intended or tested. Dow personnel are available to answer your questions and to provide reasonable technical support. Dow product literature, including safety data sheets, should be consulted prior to use of Dow products. Current safety data sheets are available from Dow.

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