City of Bentonville, Arkansas
Bentonville WRRF Improvements

B&V Project 417296
B&V File 80.0930.01
November 25, 2025

Crossland Heavy Contractors
Attention: Mr. Matt Hardin

Reference is made to your Submittal 15251-01-A Mechanical Insulation for Plumbing dated November 10, 2025. The following data pertains to Section(s) 15251 of the Specifications.

			Review Status					
Identification	Manufacturer	Description	CODE 1 - NO EXCEPTIONS NOTED	CODE 2 - COMMENTS NOTED	CODE 3 - COMMENTS NOTED/CONFIRM	CODE 4 - COMMENTS NOTED/RESUBMIT	CODE 5 - REJECTED/RESUBMIT	CODE 6 - RECEPT ACKNOWLEDGED
Data	Knauf Insulation	Mechanical Insulation for Plumbing – REV A	X					

Engineer's review of drawings and data submitted by Contractor covers only general conformity to the Drawings and Specifications, external connections and dimensions which affect the layout. Engineer's review does not indicate a thorough review of all dimensions, quantities, and details of the material equipment, devices, or item shown. Engineer's review shall not relieve Contractor of Contractor's responsibility for errors, omissions, or deviations in the drawings and data, nor of the Contractor's sole responsibility for compliance with the Contract Documents.

Remarks:

1. None.

BLACK & VEATCH CORPORATION

Bridget Moore
Engineering Manager

By: Michele Roth

24A03SP - Bentonville WRRF Improvements

1901 N.E. A Street
Bentonville, Arkansas 72712
United States

Crossland Heavy Contractors, Inc.
1800 S 52nd St, Ste 410
Rogers, Arkansas 72758
United States
(479) 464-7077

Title
15251 - Mechanical Insulation for Building Mechanical : Product Information : HVAC

Submittal Manager
Adrian Ensaldo

Spec Section
15251 - Mechanical Insulation for Building Mechanical

Type
Product Information

Number
15251-1

Rev
A

Description
A complete list of materials and catalog cuts, together with detailed specifications, materials performance data, installation instructions, parts, devices, and accessories furnished, shall be submitted in accordance with the Submittals Procedures section. Information shall include certified test results to show compliance with UL, NFPA, and ASTM safety requirements.

Quality People. Building Solutions.

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

Date: 9/5/25
Return Request: 9/26/25
Project: Bentonville WRRF
Supplier: Various
Manufacturer: Various
Submittal: Mech Insulation
Submittal Number: 15251-01
Spec Section: 15251
Drawing #: Mechanical

ENGINEER
Hawkins Weir

GENERAL CONTRACTOR
Crossland Heavy Contractors

ENGINEER
Black and Veatch

MECHANICAL SUBCONTRACTOR
Comfort Systems USA
(Arkansas), Inc.
116 Commercial Ave
Lowell, AR 72745
479-770-8992

Notes:

Condensate Drain Piping Insulation

CSUSA PROJECT NO.
25-5027
jzuber@comfortar.com

4806 Rixey Road
No. Little Rock, AR 72117

Pro Insulation

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

October 24, 2025

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

Mr. Josh Zuber

Re: Mechanical Insulation Submittals for Bentonville WWRF, Bentonville, Arkansas.

Spec Section 15251-2.02.A.2 Armaflex type PFC-1 Insulation.

The following items will be insulated with Armacell Armaflex PFC-1 black lap seal pipe cover. All joints and seams will be sealed with 520 adhesive.

Item #1 Interioir Condensate Drains which pass through space above finished ceilings, or is exposed above equipment, electrical panels or cabinets---------- 1" Thick

Thank You,

Scott Fairclough

SOLUTIONS FOR ENERGY SAVINGS

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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

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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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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 m^2/gallon or 5 m^2/l) max, single coat (depending upon porosity of materials bonded and air temperature).				

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

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