



Submittal Comments

Item No: 220700-01
(CSI No:)

Item
Descript: Plumbing Insulation

Re: **Submittal** Comments
Cascade Science Lab Renovation
2008-046.CSL 8.3

Architecture
Engineering
Technology
Interior Design
Landscape Architecture

Wil-Fra-Mar Building
320 East Vermont Street
Indianapolis IN 46204-1640
317.263.6226
317.263.6224 (fax)
www.schmidt-arch.com

Reviewed and checked only for conformance with design concepts and with the information given in the Contract Documents. Approval does not release the Contractor from the responsibility to provide appropriate quantities, field measurements, dimensional stability, installation, anchorage, and coordination with other trades or release the Contractor from responsibility for deviations from the requirements of the Contract Documents or from responsibility for errors and omissions contained thereon.

X	Reviewed as Submitted - No Resubmittal Required.
	Reviewed as Noted - No Resubmittal Required.
	Reviewed as Noted - Revise and Resubmit.
	Rejected - Revise and Resubmit.
	Not Required for Review - Returned.
By: Michael Perry	
Date: May 18, 2009	

Comments

Copy: File

Tricia L. Smith

From: ken meiring [kenmeiring@kpmeiring.com]
Sent: Friday, May 01, 2009 9:35 AM
To: Tricia L. Smith
Subject: Cascade Science Lab Renovation Submittal Section 220700-Plumbing Insulation
Attachments: 220700 - Plumbing Insulation.pdf

Hello Trish,

Attached is Plumbing 220700-Plumbing Insulation

Thanks

Kenneth P. Meiring
KP Meiring Company
6519 North Carrollton Avenue
Indianapolis, IN 46220-1616
(317) 257 7506 x 3
(317) 254 1305 fax
kenmeiring@kpmeiring.com
www.kpmeiring.com

INSUL-LOCK® Seam-Seal 6-Foot

Seam-Seal Insulation

**Flexible Closed Cell Insulation
Designed for the HVAC/R Industry**



DESCRIPTION

INSUL-LOCK® Seam-Seal pipe insulation is an environmentally friendly, CFC-free, flexible elastomeric insulation, pre-slit with a factory-applied pressure sensitive adhesive. It is black in color and identified as INSUL-LOCK® Seam-Seal. This superior closed cell insulation is designed to retard heat flow and prevent condensation when properly installed. INSUL-LOCK® Seam-Seal pipe insulation is pre-slit with a factory applied specially formulated bonding adhesive applied to both seam surfaces and comes with convenient built-in release liners which allow for easy installation. It is available in wall thicknesses of 3/8" through 1" and in sizes ranging from 3/8" to 4" IPS. **INSUL-LOCK® Seam-Seal key physical properties are approved through supervision by Factory Mutual Research Corporation.** INSUL-LOCK® Seam-Seal is non-porous, non-fibrous and resists mold growth. An EPA registered antimicrobial agent is incorporated into the product providing additional protection against mold, fungal and bacterial growth.

K-Flex USA elastomeric insulation products are GREENGUARD® certified as low VOC materials, meeting the requirements of the "Children and Schools" classification, the most stringent requirements. Additionally, all K-Flex USA elastomeric insulation products are GREENGUARD® listed for mold resistance and meet the "mold resistant" criteria.

APPLICATIONS

INSUL-LOCK® Seam-Seal has the

same excellent insulation properties as standard INSUL-TUBE® and is used on similar applications such as refrigerant lines, cold water plumbing, roof drains and chilled water systems. INSUL-LOCK® Seam-Seal is recommended for applications ranging from -70°F to 200°F (-57°C to 93°C) for both new and existing applications. INSUL-LOCK® Seam-Seal can be used with heat tracing/heat tapes. For best results, store and install INSUL-LOCK® Seam-Seal at temperatures above 40°F (4°C).

INSUL-LOCK®'s Seam-Seal closure system is designed to save labor costs, particularly on straight runs. It greatly reduces the use of contact adhesives, thus allowing for improved working conditions and compliance with OSHA requirements. **INSUL-LOCK® Seam-Seal has superior cold weather flexibility.**

INSTALLATION

INSUL-LOCK® Seam-Seal is pre-slit with convenient built-in tabs for easy installation: slip on the tube, pull the tab, pinch it shut and apply pressure to the seams. The seam should be positioned on the bottom of the pipe. See technical bulletin for installation instructions in cold temperatures.

All butt joints must be sealed with an approved contact adhesive. Fittings are fabricated from miter-cut tubular sections or from INSUL-SHEET®. K-Fit™ factory fabricated fittings are available.

OUTDOOR APPLICATIONS

INSUL-LOCK® Seam-Seal pipe insulation is made from a UV resistant elastomeric blend. For moderate UV exposure, no additional protective coating needed. However, for severe UV exposure (roof-top applications) or where optimum performance is required, 374 Protective Coating or approved jacketing or cladding should be used. *For more detailed information refer to the Installation*

- Ideal for straight runs
- Less use of contact adhesives

RESISTANCE TO MOISTURE VAPOR FLOW

The closed-cell structure and unique formulation of INSUL-LOCK® Seam-Seal effectively retards the flow of moisture vapor, and is considered a low transmittance vapor retarder. For most indoor applications, INSUL-LOCK® Seam-Seal needs no additional protection.

Additional vapor barrier protection may be necessary for INSUL-LOCK® Seam-Seal when installed on low temperature surfaces that are exposed to continuous high humidity.

FLAME AND SMOKE RATING

INSUL-LOCK® Seam-Seal pipe insulation in thicknesses up to 1-1/2" (38 mm) has a flame spread rating of 25 or less and a smoke development rating of 50 or less as tested by ASTM E 84 Method of Testing entitled: "Surface Burning Characteristics of Building Materials." INSUL-LOCK® Seam-Seal Pipe Insulation is acceptable for use in duct/plenum applications meeting the requirements of NFPA 90A/B.

Numerical flammability ratings alone may not define the performance of products under actual fire conditions. They are provided only for use in the selection of products to meet limits specified, when compared to a known standard.

SPECIFICATION COMPLIANCE

ASTM C 534 Type 1 (Tubing), Grade 1
ASTM D 1056-00-2C1
New York City MEA 186-86-M Vol. IV
USDA Requirements

UL 94-5V Flammability Classification (Recognition No. E300774)
ASTM E 84 1-1/2" 25/50-tested according to UL 723 and NFPA 255
Complies with requirements of CAN/ULC S102-03

FMRC Approval Guide
Chapter 14 Pipe Insulation

Meets requirements of NFPA 90A
Sect. 2.3.3 for Supplementary Materials for Air Distribution Systems

Meets requirements of ASTM C 411 (Test Method for Hot Surface Performance of High Temperature Thermal Insulation)

Meets requirements of UL 181 sections 11.0 and 16.0 (Mold Growth/Air Erosion)

K.P. MEIRING CO

CHECKED BY: KPM

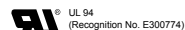
DATE CHECKED: May 1, 2009

REVIEWED NO EXCEPTIONS: XX

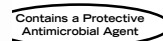
REVIEWED WITH EXCEPTIONS: _____

REJECTED RESUBMIT: _____

The review is only for general conformance with design concepts given in the contract documents. Subcontractor is responsible for dimensions, quantities, coordination with other trades and performing his work in a safe manner. No change to contract requirements is intended.



UV resistant Refer to K-Flex USA L.L.C. Technical Bulletin (Outdoor Applications) for More Information



INSUL-LOCK® Seam-Seal Pipe Insulation

PRODUCT DATA

Physical Properties		INSUL-LOCK® Insulation	Test Methods
Thermal Conductivity (K)	90°F (32°C) Mean Temp	.27 (.039)	ASTM C 177/C 518
BTU - in/hr - Ft² - °F (W/mK)	75°F (24°C) Mean Temp	.25 (.036)	ASTM C 177/C 518
Density		3-6 PCF	ASTM D 1622/D 3575
Operating Temperature Range			
Upper		200°F (93°C)	
Lower		-70°F (-57°C)	
Water Vapor Permeability Dry Cup. Perm-In		<0.06	ASTM E 96
Water Absorption %		<0.20 by volume	ASTM C 209
Flame Spread (up to 1-1/2" wall)		Not greater than 25	ASTM E 84
Smoke Developed (up to 1-1/2" wall)		Not greater than 50	ASTM E 84
Ozone Resistance		Pass	ASTM D 1171
Chemical/Solvent Resistance		Good	
Mildew Resistance/Air Erosion		Pass	UL 181

Thickness Recommendations* - To Control Condensation

Pipe Size	Line Temp 50°F 10°C		Line Temp 35°F 2°C		Line Temp 0°F -18°C		Line Temp -20°F -29°C	
	Normal Conditions (Max 85°F, 29°C - 70% R.H.)							
3/8" I.D. thru 1-3/8" I.D.	3/8"	10 mm	1/2"	13 mm	3/4"	19 mm	1"	25 mm
Over 1-3/8" thru 3" IPS	3/8"	10 mm	1/2"	13 mm	1"	25 mm	1"	25 mm
Over 3" IPS thru 4" IPS	1/2"	13 mm	1/2"	13 mm	1"	25 mm	1-1/4"	32 mm
Over 4" IPS	1/2"	13 mm	3/4"	19 mm	1"	25 mm	1-1/4"	32 mm
Mild Conditions (Max 80°F, 26°C - 50% R.H.)								
3/8" I.D. thru 2-1/8" I.D.	3/8"	10 mm	3/8"	10 mm	1/2"	13 mm	1/2"	13 mm
Over 2-1/8" thru 3" IPS	3/8"	10 mm	3/8"	10 mm	1/2"	13 mm	3/4"	19 mm
Over 3" IPS thru 4" IPS	1/2"	13 mm	1/2"	13 mm	3/4"	19 mm	3/4"	19 mm
Over 4" IPS	1/2"	13 mm	1/2"	13 mm	3/4"	19 mm	3/4"	19 mm
Severe Conditions (Max 90°F, 32°C - 80% R.H.)								
3/8" I.D. thru 1-1/8" I.D.	3/4"	19 mm	3/4"	19 mm	1-1/4"	32 mm**	1-1/4"	32 mm**
Over 1-1/8" thru 4" IPS	3/4"	19 mm	1"	25 mm	1-1/2"	38 mm**	1-1/2"	38 mm**

*INSUL-LOCK® in thickness noted within the specified temperature ranges will prevent condensation in indoor piping under design conditions defined below.

**Thickness recommendations above 1" can be sleeved to achieve thickness desired.

Normal: Maximum severity of indoor conditions seldom exceed 85° F and 79% R.H. in United States.

Mild: Typical conditions are most air-conditioned spaces and arid climates.

Severe: Generally found in areas where excessive moisture is introduced or in poorly ventilated areas where the temperature may be depressed below the ambient.

Under conditions of higher humidity, additional thickness of insulation may be required.

NOTE: Thickness recommendations calculated using 0.2575 K-factor (0.25 plus 3% test error allowance)

INSUL-LOCK® "R" Values

Pipe O.D. or Normal Insulation I.D.		R Value 3/8" (10 mm) wall	R Value 1/2" (13 mm) wall	R Value 3/4" (19 mm) wall	R Value 1" (25 mm) wall
3/8"	10 mm	2.6	3.5	5.5	—
1/2"	13 mm	2.5	3.3	5.2	—
5/8"	16 mm	2.4	3.2	5.3	7.4
3/4"	19 mm	2.3	3.0	5.3	7.3
7/8"	22 mm	2.2	3.1	5.3	7.0
1-1/8"	29 mm	2.3	3.1	5.5	7.1
1-3/8"	35 mm	2.1	3.1	5.2	7.2
1-5/8"	41 mm	2.5	3.1	5.2	7.1
1-1/2" IPS	—	2.4	3.0	5.0	6.7
2-1/8"	54 mm	2.5	3.2	5.0	6.8
2" IPS	—	2.5	3.1	4.9	6.6
2-1/2" IPS	64 mm	2.5	3.2	4.8	6.4
2-5/8"	67 mm	2.4	3.2	4.8	6.5
3-1/8"	79 mm	2.3	3.1	4.6	6.2
3" IPS	—	2.4	3.3	4.7	6.2
3-5/8"	92 mm	2.3	3.2	4.6	6.0
4-1/8"	105 mm	2.3	3.1	4.6	5.9
4" IPS	—	2.3	3.2	4.6	5.9

Note: "R" factors were calculated using a K factor of 0.2575 (0.25 plus 3% test error allowance at 75°F, 24°C mean temp.) and nominal wall thickness is each case. Lower operating temperatures will result in improved R values. Contact Technical Services for specific recommendations.



K-Flex USA - 100 Nomaco Drive - Youngsville, NC 27596 - toll free 800-765-6475 - fax 800-765-6471 - www.kflexusa.com

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