

# BCM *Technical*

BCM Technical, LLC  
2175 Avon Industrial Dr.  
Rochester Hills, MI 48309  
Phone: 248-289-1348  
Toll Free: 877-488-4834  
Fax: 248-289-6317  
SalesInfo@pipeinsulation.net



# BCM Technical Catalog Index

## Pipe Insulation

079 Series [Pg. 03](#)

ASJ 79 [Pg. 04](#)

379 Series [Pg. 05](#)

879 Series [Pg. 06](#)

VX Series [Pg. 07](#)

Sheet Stock [Pg. 08](#)

Hexwrap [Pg. 09](#)

Acoustic Foam [Pg. 10](#)

Fittings and Insert [Pg. 11](#)

Jacketing [Pg. 12](#)

Accessories [Pg. 13](#)

Recommended Insulation Thicknesses [Pg. 14](#)

## Installation Guides

079 Series Quick Installation Guide [Pg. 15](#)

379 Series Quick Installation Guide [Pg. 16](#)

879 Series Quick Installation Guide [Pg. 17](#)

ASJ 79 Quick Installation Guide [Pg. 18](#)

BCM Services [Pg. 19](#)

- Works with Field-Applied Jackets
- Noise reduction

## 079 Series



BCM's 079 Series is a lightweight, open cell melamine foam insulation developed as an alternative to traditional insulation systems. This high performance insulation has a wide temperature range, low smoke and flame properties and is available in several sizes and shapes including preformed pipe insulation and fittings, flat sheets, die cut parts, and custom cut v-grooved sheets to wrap around large cylindrical surfaces. Custom shapes and profiles are available by request. BCM's foam is easily trimmed, cut, and sliced in the field reducing installation time compared to many other insulation materials. In addition to providing excellent insulation properties, BCM's Insulation also provides outstanding acoustical performance. 079 plain foam is also available with a variety of factory applied jacketing.

### Uses and Applications

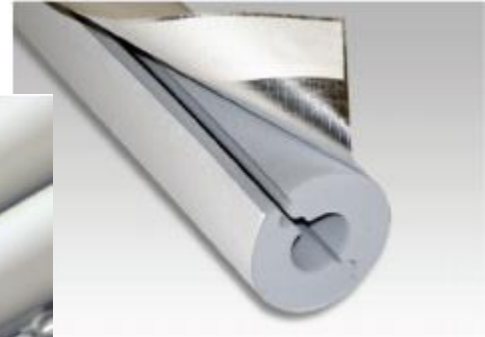
- Complete pipe/tube Insulation systems
- Tanks and vessels
- Noise reduction
- Clean rooms
- Sanitary/food processing

### Insulation Specifications

• Insulation material	Open cell Melamine foam
• Service temperature	-40°F to 350°F
• Thermal conductivity, k	0.25 BTU•in/hr•ft <sup>2</sup> •°F
• Density	0.56 ± 0.06 lb/ft <sup>3</sup>
• Flame spread/smoke development	5/10 per ASTM E84
• Color	Light grey
• Standard thickness	1", 1½", 2", 2½", 3"

## ASJ 79

- Works with Field-Applied Jackets
- Noise reduction



BCM's ASJ 79 Series pipe insulation is an all service high performance insulation system developed specifically for the insulation contractor. This system provides the contractor a lightweight non-fibrous insulation material that is easy to fabricate and can be installed very efficiently.

When properly installed, BCM's ASJ 79 Series is an economical insulation system that can be used in place of conventional insulation materials.

This system is also the best candidate for a secondary metal or plastic lagging, as the ASJ 79 will provide only a simple protection against abuse. The "All Service Jacket" System consists of a paper/foil/scrim vapor barrier jacket that is permanently laminated to the BCM Insulation and should not be exposed to wash downs.

### Uses and Applications

- Indoor Use Only
- Commercial, Institutional and Industrial Facilities
- Can be used with Field-Applied Jackets

### Jacket Specifications

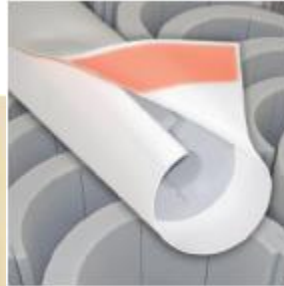
• Jacket Material	ASJ paper/foil/scrim
• Thickness	0.010"
• Jacket Color	White Only
• Service Temperature	-40°F to 240°F
• Flame spread/smoke development	25/50 per ASTM E-84

### Insulation Specifications

• Insulation material	Open cell Melamine foam
• Service temperature	-40°F to 350°F (min/max pipe temp.)
• Thermal conductivity, k	0.25 btu-in/hr-ft <sup>2</sup> -°F
• Density	0.56 ± 0.06 lb/ft <sup>3</sup>
• Flame spread/smoke development	25/50 per ASTM E84
• Color	Light grey
• Standard Thickness	1, 1½", 2", 2½", 3"

- Highly Resilient
- Absorbs Impacts
- Maintains Vapor Barrier
- Color Coded Jacketing

## 379 Series



### Uses and Applications

- Indoor and outdoor
- Chemical and industrial plants
- Tanks and vessels
- Roof piping
- Solar collector piping

BCM's 379 series insulation is a heavy duty insulation designed for harsh indoor and outdoor applications. The jacket is a UV stabilized, flexible PVC reinforced with polyester fibers providing exceptional strength and tear resistance while remaining flexible; enabling it to be impacted and return to its original shape while retaining its vapor barrier. BCM's 379 series is available as pipe insulation, flat sheet, and v-grooved sheets to wrap ducts, tanks, and large storage vessels. In addition, several colors are available from the factory eliminating the need to paint after installing.

BCM's 379 Series is an excellent, high performance insulation system available for both indoor and outdoor environments.

### Jacket Specifications

• Jacket material	PVC reinforced with PET fibers
• Thickness	0.030"
• Ambient temperature range	-40°F to 140°F (min/max external jacket temp.)
• Flame spread/smoke development	25/50 per ASTM E84
• Weight	28 oz/yd <sup>2</sup>
• Colors	Variety available *listed below

### Insulation Specifications

• Insulation material	Open cell Melamine foam
• Service temperature	-40°F to 350°F (min/max pipe temp.)
• Thermal conductivity, k	0.25 btu-in/hr-ft <sup>2</sup> -°F
• Density	0.56 ± 0.06 lb/ft <sup>3</sup>
• Flame spread/smoke development	25/50 per ASTM E84
• Color	Light grey
• Standard Thickness	1", 1½", 2", 2½", 3"

### Standard colors



WHITE



BLUE



GRAY



BLACK

## 879 Series

- Wash-down safe
- Clean glossy surface
- Easy to install
- Available in multi-colors



BCM's 879 Series pipe insulation is a sanitary insulation system developed for clean room and food processing environments. Excellent antibacterial and wash-down properties are standard features for the 879 System. The mirror smooth finish not only works well but also looks the part in all clean/food environments, providing years of clean and sanitary service. The hard, gloss surface never needs painting. The BCM 879 Series is the best high performance insulation system for the food processing and clean room environment.

This high performance system uses a smooth semi-rigid PVC exterior jacket that is permanently laminated to the BCM insulation.

### Uses and Applications

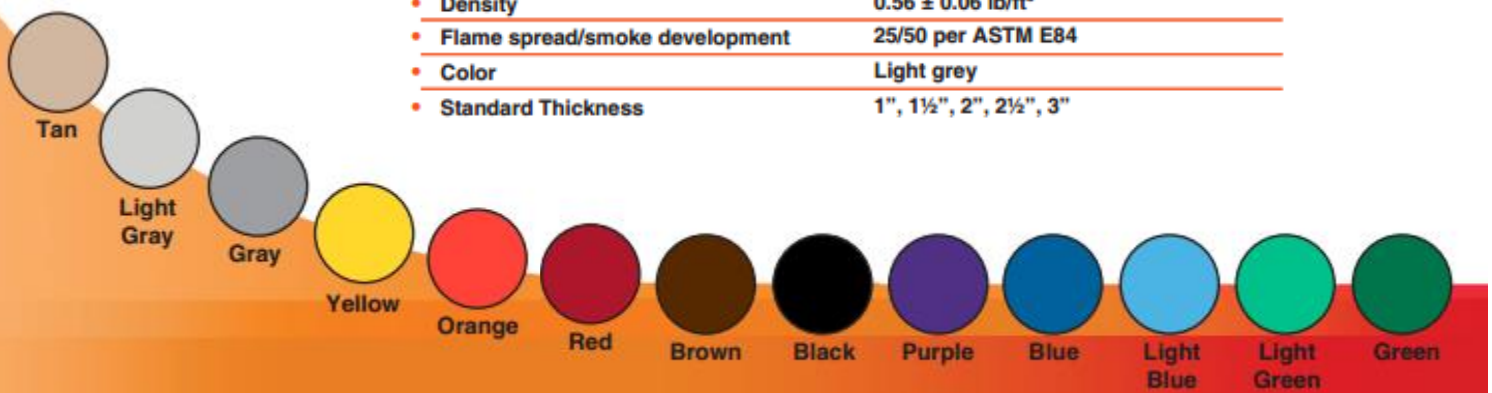
- General Indoor Use
- Clean Room Certified
- Chemical and Industrial Plants
- Sanitary Applications
- Wash-down Environments

### Jacket Specifications

• Jacket Material	PVC
• Thickness	0.020"
• Jacket Color	Standard Color is White (color optional)
• Service Temperature	0°F to 140°F
• Flame spread/smoke development	25/50 per ASTM E-84

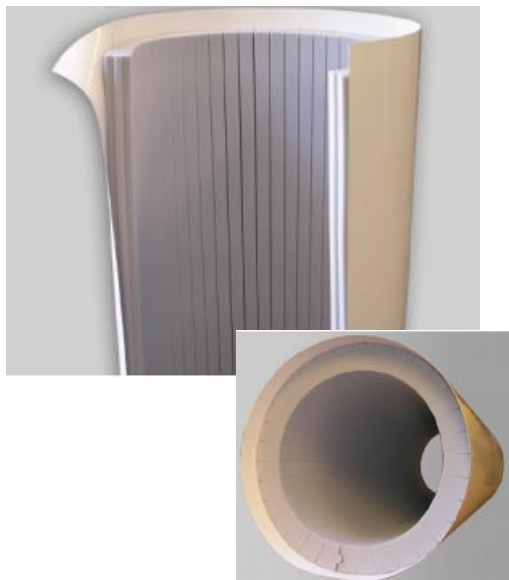
### Insulation Specifications

• Insulation material	Open cell Melamine foam
• Service temperature	-40°F to 350°F (min/max pipe temp.)
• Thermal conductivity, k	0.25 btu-in/hr-ft <sup>2</sup> -°F
• Density	0.56 ± 0.06 lb/ft <sup>3</sup>
• Flame spread/smoke development	25/50 per ASTM E84
• Color	Light grey
• Standard Thickness	1", 1½", 2", 2½", 3"





## VX Series



The BCM VX Pipe insulation system has been designed and developed to insulate large piping. The VX system profile allows for very easy installation around large pipes, ducts, tanks and vessels. Installation is easily accomplished by a single installer for pipes and tubes.

The VX System starts as flat sheet melamine foam which is precision cut to your OD and wall thickness specifications. It will more easily wrap around pipes while providing a significant cost savings to the standard preformed pipe insulation sections offered for larger pipes. The ship-lap joint used in our patented BCM pre-formed insulation system is still incorporated into this design in order to provide a secure seam.

The VX system is available pre-jacketed in your choice of ASJ, 300-series reinforced flexible PVC or 800-series rigid, glossy, sanitary PVC jackets. VX insulation is available for pipe sizes of 6" diameter and larger for large tanks and vessels.

BCM VX System is an excellent, high performance insulation system available for both indoor and outdoor environments.

### Uses and Applications

- Heavy-duty Indoor & Outdoor
- Large Piping and Ducts
- Tanks and Vessels

### Jacket Specifications

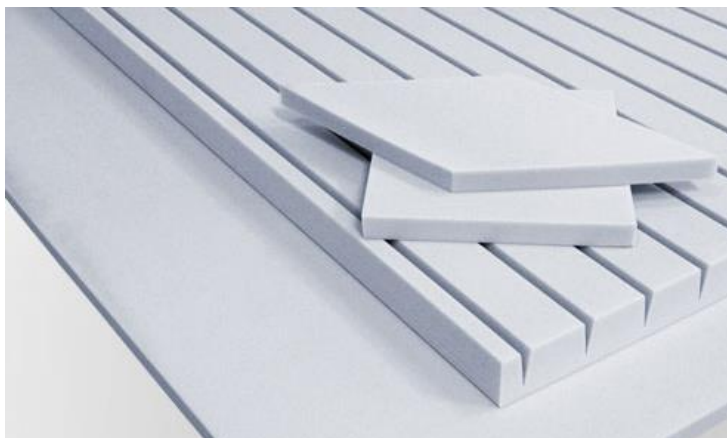
- Available in ASJ, 300 and 800 series

### Insulation Specifications

• Insulation material	Open cell Melamine foam
• Service temperature	-40°F to 350°F (min/max pipe temp.)
• Thermal conductivity, k	0.25 btu-in/hr·ft <sup>2</sup> ·°F
• Density	0.56 ± 0.06 lb/ft <sup>3</sup>
• Flame spread/smoke development	25/50 per ASTM E84
• Color	Light grey
• Standard Thickness	1½", 2", 2½", 3"

- Easy to install
- Flexible
- High Temperature
- Low Smoke and Flame Ratings

## Sheet Stock



### Uses and Applications

- Indoor and Outdoor use
- HVAC Ducting
- Tanks and Vessels
- Noise Reduction

BCM's Sheet Insulation is precision-machined for use on duct work, vessels and custom applications that require a non-fibrous, lightweight insulation material. Sheet Stock is produced in two forms; Flat Sheet and V-grooved Sheet. Flat sheets are produced for insulating flat and slightly curved surfaces. V-grooved sheet materials are produced to accommodate curved and cylindrical surfaces. Available with factory-applied jackets or plain for field applied lagging.

### Insulation Specifications

<b>Insulation Material</b>	<b>Flexible Open-Cell Melamine</b>
<b>Service Temperature</b>	<b>-40°F to +350°F</b>
<b>Density</b>	<b>0.56 ± 0.06 lb/ft<sup>3</sup></b>
<b>Thermal Conductivity (K factor) @75°F</b>	<b>0.25 btu-in/hr-ft<sup>2</sup>-°F</b>
<b>Flammability</b>	<b>5/10 per ASTM E84</b>
<b>Standard Thickness</b>	<b>1", 1.5", 2", 2.5", 3"</b>



## Hexwrap



Adaptable insulation packages for plate and frame heat exchangers allowing on-site installation. Provides personnel burn protection, condensation control, and reduces heat loss. Closed cell foam is used in below ambient applications whereas high temperature open cell melamine foam is used for above ambient applications. Most units feature removable panels via Velcro® closures to simplify maintenance.

- Noise attenuation
- Personnel safety
- Minimal smoke and flame properties
- No additional flame retardants

## Acoustic Foam



BCM's foam is easily trimmed, cut, and sliced in the field reducing installation time compared to many other insulation materials. In addition to providing excellent insulation properties, BCM's Insulation also provides outstanding acoustical performance. 079 plain foam is also available with a variety of factory applied jacketing.

### Uses and Applications

- Ceilings
- Sound studios
- Anechoic chambers
- Ductwork
- Noisy pipes

### Insulation Specifications

Insulation Material	Flexible Open-Cell Melamine
Service Temperature	-40°F to +350°F
Density	0.56 ± 0.06 lb/ft <sup>3</sup>
Thermal Conductivity (K factor) @75°F	0.25 btu-in/hr-ft <sup>2</sup> -°F
Flammability	5/10 per ASTM E84
Standard Thickness	1", 1.5", 2", 2.5", 3"

- Easy to install
- No special tools required
- Color coded
- Indoor and Outdoor use

## Fittings and Inserts



### Uses and Applications

- 90°s, 45°s, Tee's
- Flanges
- Victaulic's
- Many more

BCM's fitting insulation inserts are available in preformed or diaper form. The preformed inserts are precision ground to provide a good fit within the pipe tolerances. The diapers are conditioned at the factory to allow added flexibility to the insert. Fabricated from high temperature melamine foam, the fittings have a service temperature of -150°F to +400°F. White or color coded low smoke 20 mil PVC fitting covers are shipped with the fitting insulation inserts. The PVC covers are UV inhibited and resistant to harsh weather conditions and many chemicals.

### PRODUCTS:

- |   |   |
|---|---|
| <ul style="list-style-type: none"> <li>❖ Preformed Inserts</li> <li>❖ Diaper Inserts               <ul style="list-style-type: none"> <li>✓ 90° Elbows</li> <li>✓ 45° Elbows</li> <li>✓ Tees/Valves</li> <li>✓ End Caps</li> <li>✓ Flanges</li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>❖ Fitting Covers with Preformed Inserts</li> <li>❖ Fitting Covers with Diaper Inserts               <ul style="list-style-type: none"> <li>✓ 90° Elbows</li> <li>✓ 45° Elbows</li> <li>✓ Tees/Valves</li> <li>✓ End Caps</li> <li>✓ Flanges</li> </ul> </li> </ul> |
|---|---|

### Insulation Specifications

Insulation Material	Flexible Open-Cell Melamine
Service Temperature	-40°F to +350°F
Density	0.56 ± 0.06 lb/ft <sup>3</sup>
Thermal Conductivity (K factor) @75°F	0.25 btu-in/hr-ft <sup>2</sup> -°F
Flammability	5/10 per ASTM E84
Standard Thickness	1", 1.5", 2", 2.5", 3"

- User friendly
- Easy to install
- Cost effective
- Low maintenance

## Jacketing



BCM's Self-Sealing Lap (SSL) Protective Jackets consist of 4-foot lengths of a wide choice of tough, durable, jacket materials. They are factory cut to fit exact diameters of piping insulation, tanks, vessels, or ductwork to be recovered or encapsulated in the field.

The factory applied SSL design provides for ease of installation and sealing the overlap. The seams of the jacket are sealed with fastener weld and/or silicone sealant depending on the jacket material.

SSL Protective Jackets are also used for color-coding existing systems. SSL Protective Jackets are used to re-cover tar paper, Kraft paper, or even metal jacket that is ragged, torn, bent, and no longer providing protection from the elements. SSL Protective Jackets can be installed quickly and easily. They provide many years of protection from chemicals, salt spray, ultraviolet, rain, snow, and extreme physical abuse.

### Uses and Applications

- Re-jacket old installations
- Moisture-proof ASJ
- Color coding

### PRODUCTS:

- ❖ PVC Fitting Covers
- ❖ SSL Pre-cut Jacket - ASJ
- ❖ SSL Pre-cut Jacket - 300
- ❖ SSL Pre-cut Jacket - 800
- ❖ Bulk Jacket Material

## Accessories

- Prevent moisture ingress
- Seals against power washing
- Create custom protective shield
- Foam safe insulation bonding



BCM offers all of the required accessories for a complete installation. Review the installation instructions for recommended products.

### Uses and Applications

- Sealing exterior seams
- Sealing exposed foam
- Taping closed seams
- Maintaining vapor barrier

### PRODUCTS:

- |  |   |
|--|---|
| <ul style="list-style-type: none"> <li>❖ Fastener Weld               <ul style="list-style-type: none"> <li>✓ Can</li> <li>✓ Quart</li> <li>✓ Gallon</li> </ul> </li> <li>❖ Applicator Cans               <ul style="list-style-type: none"> <li>✓ Plastic</li> <li>✓ Metal</li> </ul> </li> <li>❖ PVC Tape               <ul style="list-style-type: none"> <li>✓ Black</li> <li>✓ Brown</li> <li>✓ White</li> <li>✓ Red</li> <li>✓ Yellow</li> <li>✓ Blue</li> <li>✓ Green</li> <li>✓ Gray</li> <li>✓ Orange</li> <li>✓ Clear</li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>❖ ASJ Tape</li> <li>❖ Sealants               <ul style="list-style-type: none"> <li>✓ Clear Silicone</li> <li>✓ Contact Cement</li> <li>✓ Mastic</li> <li>✓ Fosters</li> </ul> </li> <li>❖ Butt Strips</li> <li>❖ Mechanical Fasteners               <ul style="list-style-type: none"> <li>✓ Fitting Cover Tacks</li> <li>✓ Insulation Hangers with Washer</li> </ul> </li> <li>❖ Nail Hanger Adhesive</li> <li>❖ Tank Strap</li> </ul> |
|--|---|

## Recommended Insulation Thicknesses

### RECOMMENDED INSULATION THICKNESS GUIDE / °F / INCHES

PIPE SIZE	-150°F to -64°F	-65°F to 0°F	1°F to 34°F	35°F to 60°F	61°F to 95°F	96°F to 120°F	121°F to 150°F	151°F to 220°F	221°F to 250°F	251°F to 300°F	301°F to 350°F	351°F to 400°F
1/2	2	2	1 1/2	1	1	1	1	1 1/2	1 1/2	2	2	2
3/4	2	2	1 1/2	1	1	1	1	1 1/2	1 1/2	2	2	2
1	2	2	1 1/2	1	1	1	1	1 1/2	1 1/2	2	2	2
1 1/4	2	2	1 1/2	1	1	1	1	1 1/2	1 1/2	2	2	2
1 1/2	2	2	1 1/2	1	1	1	1	1 1/2	1 1/2	2	2	2
2	2 1/2	2	2	1 1/2	1	1	1 1/2	1 1/2	2	2	2	2
2 1/2	2 1/2	2 1/2	2	1 1/2	1	1	1 1/2	1 1/2	2	2	2	2
3	2 1/2	2 1/2	2	1 1/2	1	1	1 1/2	1 1/2	2	2	2	2
3 1/2	2 1/2	2 1/2	2	1 1/2	1	1	1 1/2	1 1/2	2	2	2	2
4	3	2 1/2	2	1 1/2	1	1	1 1/2	1 1/2	2	2	2 1/2	2 1/2
6	3	2 1/2	2 1/2	2	1 1/2	1 1/2	2	2	2	2	2 1/2	2 1/2
8	3	3	2 1/2	2	1 1/2	1 1/2	2	2	2	2 1/2	2 1/2	2 1/2
10	3	3	2 1/2	2	1 1/2	1 1/2	2	2	2	2 1/2	2 1/2	3
12	3	3	2 1/2	2	1 1/2	1 1/2	2	2	2	2 1/2	3	3

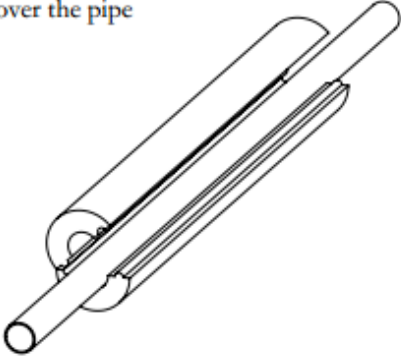
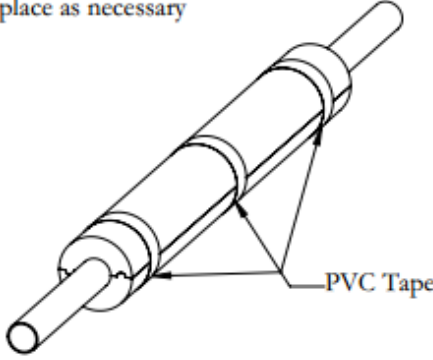
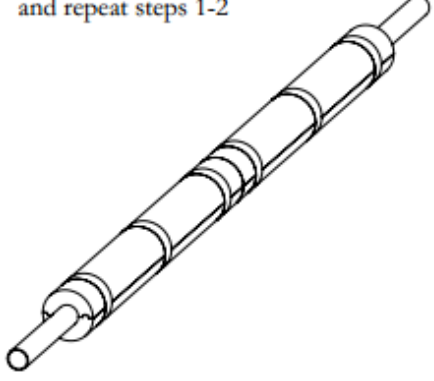
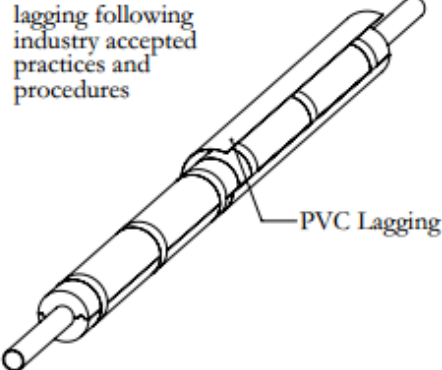
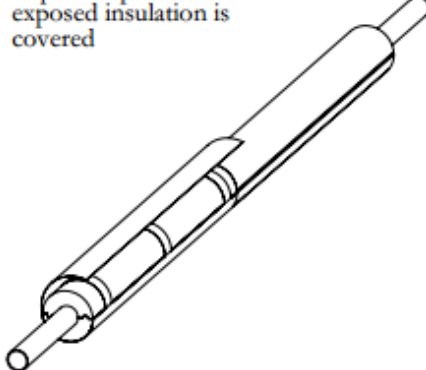
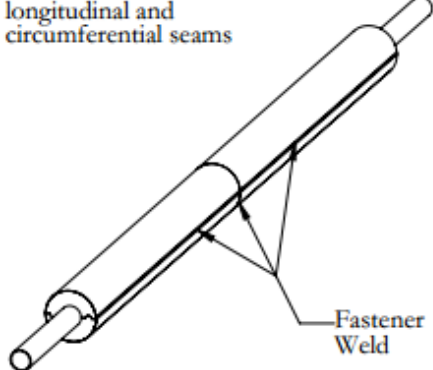
### RECOMMENDED INSULATION THICKNESS GUIDE / °C / CENTIMETERS

PIPE SIZE	-101°C to 53°C	-53°C to 18°C	18°C to 2°C	2°C to 16°C	16°C to 35°C	35°C to 49°C	49°C to 66°C	66°C to 104°C	104°C to 121°C	121°C to 149°C	149°C to 177°C	177°C to 204°C
1.27	5.08	5.08	3.18	2.54	2.54	2.54	2.54	3.81	3.81	5.08	5.08	5.08
1.91	5.08	5.08	3.18	2.54	2.54	2.54	2.54	3.81	3.81	5.08	5.08	5.08
2.54	5.08	5.08	3.18	2.54	2.54	2.54	2.54	3.81	3.81	5.08	5.08	5.08
3.18	5.08	5.08	3.18	2.54	2.54	2.54	2.54	3.81	3.81	5.08	5.08	5.08
3.81	5.08	5.08	3.18	2.54	2.54	2.54	2.54	3.81	3.81	5.08	5.08	5.08
5.08	6.35	6.35	5.08	3.81	2.54	2.54	3.81	3.81	5.08	5.08	5.08	5.08
6.35	6.35	6.35	5.08	3.81	2.54	2.54	3.81	3.81	5.08	5.08	5.08	5.08
7.62	6.35	6.35	5.08	3.81	2.54	2.54	3.81	3.81	5.08	5.08	5.08	5.08
8.89	6.35	6.35	5.08	3.81	2.54	2.54	3.81	3.81	5.08	5.08	5.08	6.35
10.16	7.62	6.35	5.08	3.81	2.54	2.54	3.81	3.81	5.08	5.08	6.35	6.35
15.24	7.62	6.35	6.35	5.08	3.81	3.81	5.08	5.08	5.08	5.08	6.35	6.35
20.32	7.62	7.62	6.35	5.08	3.81	3.81	5.08	5.08	5.08	6.35	6.35	6.35
25.40	7.62	7.62	6.35	5.08	3.81	3.81	5.08	5.08	5.08	6.35	6.35	3.00
30.48	7.62	7.62	6.35	5.08	3.81	3.81	5.08	5.08	5.08	6.35	7.62	7.62

Note : The above chart considers normal conditions of 70% humidity and 80°F.  
Consult factory for assistance on specific applications.



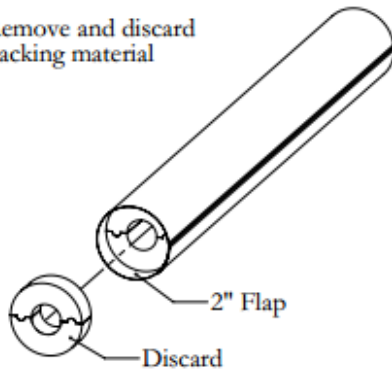
## 079 Quick Installation Guide

<p><b>Step 1:</b> Position the two halves over the pipe</p> 	<p><b>Step 2:</b> Spot tape insulation in place as necessary</p>  <p>PVC Tape</p>	<p><b>Step 3:</b> Position the next piece and repeat steps 1-2</p> 
<p><b>Step 4:</b> Install PVC field lagging following industry accepted practices and procedures</p>  <p>PVC Lagging</p>	<p><b>Step 5:</b> Repeat step 4 until all exposed insulation is covered</p> 	<p><b>Step 6:</b> Fastener Weld all longitudinal and circumferential seams</p>  <p>Fastener Weld</p>

## 379 Quick Installation Guide

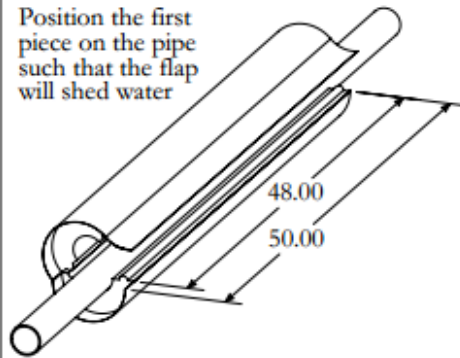
### Step 1:

Remove and discard packing material



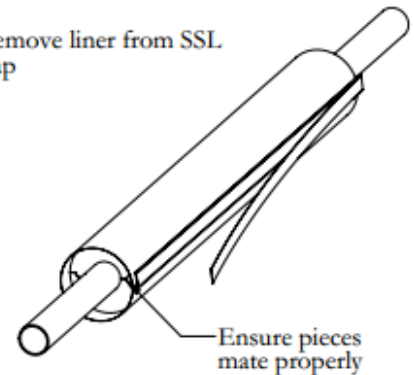
### Step 2:

Position the first piece on the pipe such that the flap will shed water



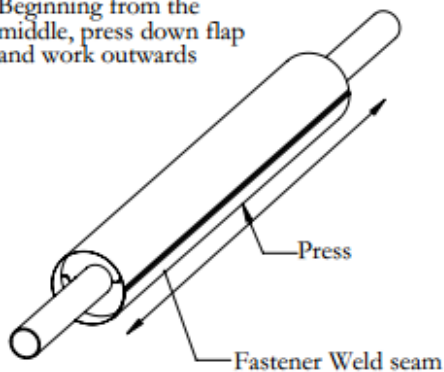
### Step 3:

Remove liner from SSL flap



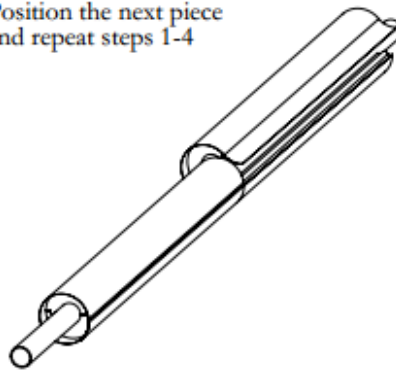
### Step 4:

Beginning from the middle, press down flap and work outwards



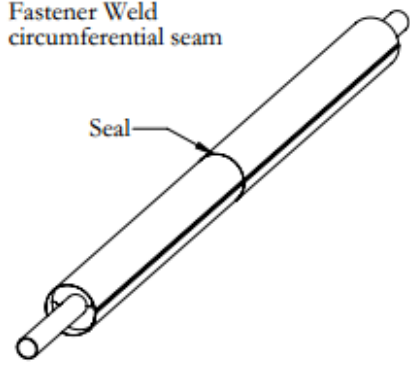
### Step 5:

Position the next piece and repeat steps 1-4



### Step 6:

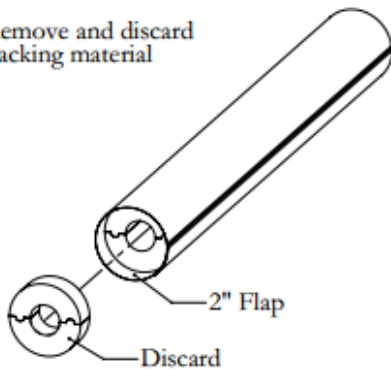
Fastener Weld circumferential seam



## 879 Quick Installation Guide

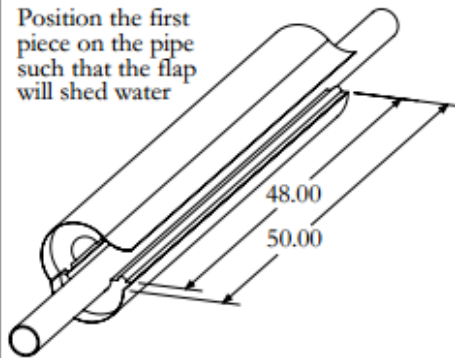
### Step 1:

Remove and discard packing material



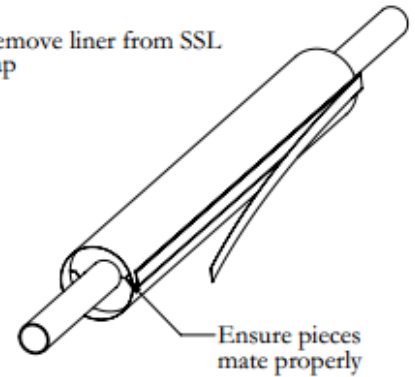
### Step 2:

Position the first piece on the pipe such that the flap will shed water



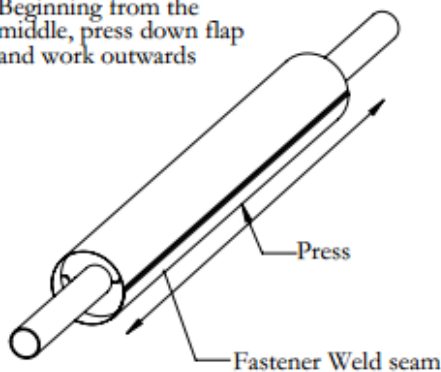
### Step 3:

Remove liner from SSL flap



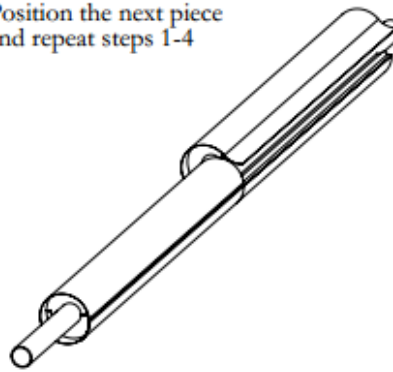
### Step 4:

Beginning from the middle, press down flap and work outwards



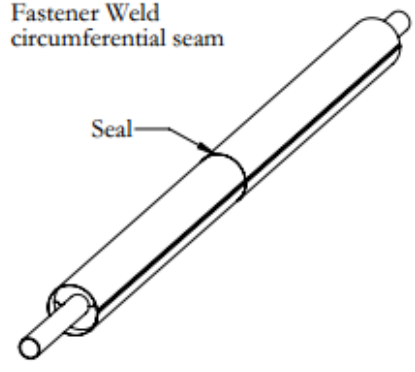
### Step 5:

Position the next piece and repeat steps 1-4



### Step 6:

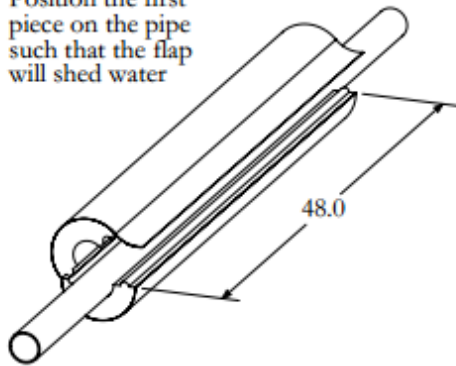
Fastener Weld circumferential seam



## ASJ 79 Quick Installation Guide

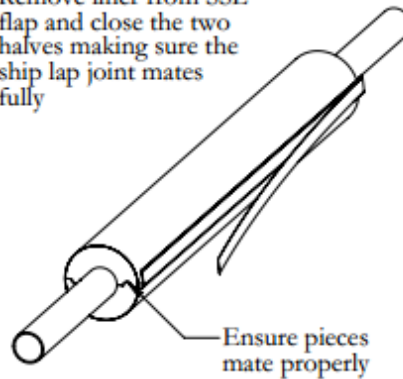
### Step 1:

Position the first piece on the pipe such that the flap will shed water



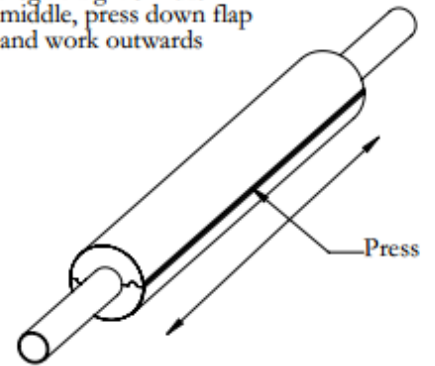
### Step 2:

Remove liner from SSL flap and close the two halves making sure the ship lap joint mates fully



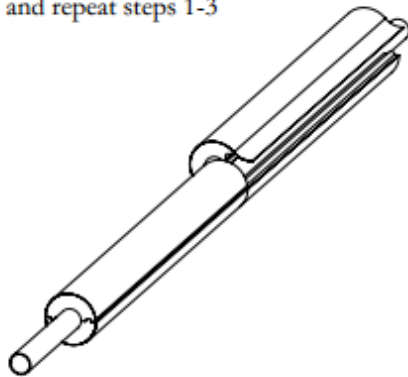
### Step 3:

Beginning from the middle, press down flap and work outwards



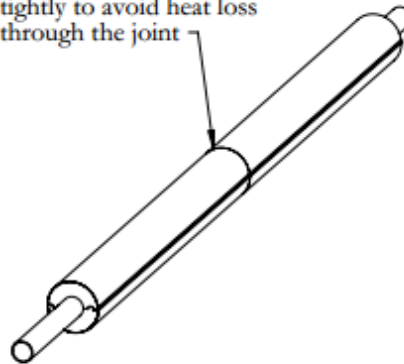
### Step 4:

Position the next piece and repeat steps 1-3



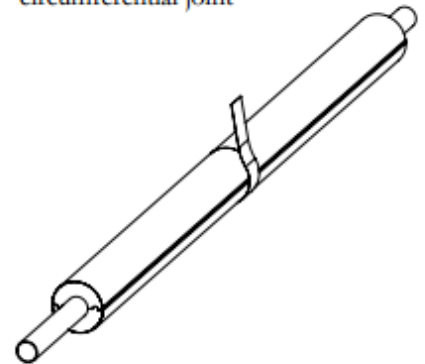
### Step 5:

Butt sections together tightly to avoid heat loss through the joint



### Step 6:

Apply ASJ butt strip to circumferential joint





# Pipe Insulation

*Your Source for High-End Pipe Insulation*

## BCM Technical

Fiber-Free Pipe Insulation

[www.pipeinsulation.net](http://www.pipeinsulation.net)

Phone: 248-289-1348

Fax: 248-289-6317

## Memtech Acoustical Noise Control

QuietCoat/ Noise Muncher  
Sound Control Curtains  
Quiet Room Enclosures  
Anechoic Chambers  
Vibration Noise Control

[www.memtechacoustical.com](http://www.memtechacoustical.com)

Phone: 248-289-1123

Fax: 248-289-6317

Download a QR code reader on your smart phone or tablet  
and scan to look at BCM Technical's website with ease.



BCM Technical  
Website

## BCM Technical

*Your Source for High-End Pipe Insulation*

2175 Avon Industrial Dr.

Rochester Hills, MI 48309

[www.pipeinsulation.net](http://www.pipeinsulation.net)

### TechLite

- |                 |                        |
|-----------------|------------------------|
| ❖ PLAIN-79      | ❖ ACOUSTIC FOAM        |
| ❖ ASJ-79-SERIES | ❖ HEXWRAP              |
| ❖ 379-SERIES    | ❖ SPECIALTY-PRODUCTS   |
| ❖ 879-SERIES    | ❖ FITTINGS AND INSERTS |
| ❖ 679-SERIES    | ❖ JACKETING            |
|                 | ❖ SHEET-STOCK          |

### *Clients that we serve include:*

- ❖ Commercial Facilities
- ❖ Institutional Facilities
- ❖ Industrial Facilities
- ❖ Chemical Plants
- ❖ Tanks and Vessels
- ❖ Clean Rooms
- ❖ Food and Beverage Industry
- ❖ Wash-Down Environments
- ❖ Pharmaceutical Industry
- ❖ and Others

**CONTACT US FOR A FREE QUOTE OR SITE SURVEY!**

**Contact: Janelle Bertolino**

**[janelle@pipeinsulation.net](mailto:janelle@pipeinsulation.net)**

Environmental Pipe Insulation to Improve Your Facility's  
Energy Use, Safety, Cleanliness, and Noise Control