PRELIMINARY

- Install insulation and any vapor retarder per project specifications. Where project spec is silent on an issue related to insulation installation, follow manufacturer's instructions.
- Refer to project specification for installation details on acoustical jacketing as requirements may differ from Johns Manville recommendations.
- When project specifications for the materials and installation of the insulation system and jacketing lack details or are significantly less thorough than the manufacturer's instructions, consideration should be given to following the manufacturer's instructions.
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1. INSTALLATION OF MUFFL-JAC JACKETING ON STRAIGHT PIPE

1.1 Installation of a single layer of mass loaded vinyl with a metal jacket – total mass of vinyl = 4.88 kg/m^2 The single layer of mass loaded vinyl is adhered to metal jacketing with adhesive film in the jacketing manufacturer's factory.

1.1.1 Cut sections of Muffl-Jac jacketing so that length is equal to the insulation system outer circumference plus a minimum of 5.1 cm (2 inches) – Figures 1 and 12.

1.1.2 Over the installed insulation and possible vapor retarder, apply Muffl-Jac jacketing with a minimum of 5.1 cm (2 inches) of overlap at longitudinal joint – Figures 1 and 12.

1.1.3 On horizontal pipe, longitudinal joints shall be placed at 3 to 4 o'clock position and joint opening shall point downward so as to naturally shed water – Figures 1 and 12.

FIGURE 1: Muffl-Jac jacketing with required ≥ 5.1cm (2") longitudinal overlap. Joint located at 3 o'clock position with joint opening pointed downward to naturally shed water.

1.1.4 On vertical pipe, longitudinal joint opening shall point away from direction of prevailing winds.

1.1.5 Circumferential joints of each successively applied piece of Muffl-Jac jacketing shall overlap previously applied adjacent piece by a minimum of 5.1 cm (2 inches) – Figure 12.

1.1.6 On vertical piping, sections of Muffl-Jac jacketing shall be applied starting at the bottom of the pipe and working upwards so that circumferential joint openings point downward to naturally shed water.

1.1.7 Follow project spec for type and use of sealant at Muffl-Jac jacketing joints. In the absence of project spec instructions to the contrary, seal all joints in Muffl-Jac jacketing with an appropriate sealant for the application. Sealant is to be applied under the overlap (between the two overlapped portions of jacketing) and not as a bead of caulk on the outer lip of the jacketing joint.

1.1.8 Apply specified banding to Muffl-Jac jacketing using wing seals or other approved seal. Depending on outer insulation system diameter, banding shall be 1.3 or 1.9 cm x 0.5 mm (½ or ¾ inch x .020 inch) stainless steel T-304 or T-316. Outer insulation diameter ≥12-inch NPS which is ≥12.75 inches (≥32.4 cm) shall use the wider 1.9 cm (¾ inch) banding.

1.1.9 Place one band over the circumferential 5.1 cm (2 inch) overlap portion of the jacketing and apply additional bands on maximum 22.9 – 30.5 cm (9-12 inch) centers – figure 2.

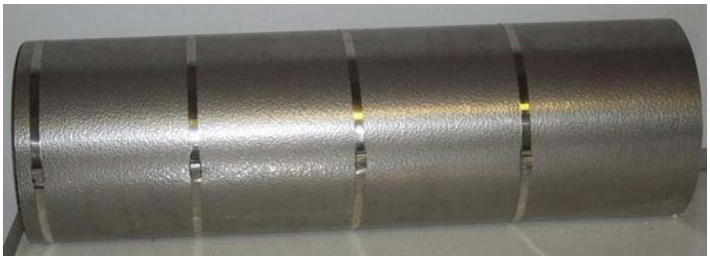

FIGURE 2: Bands on 23 cm (9") centers. Right-most band would be put over the circumferential overlap after the next section of Muffl-Jac was applied.

1.2 Installation of a double layer of mass loaded vinyl with a single metal jacket – total mass of vinyl = 9.76 kg/m2. A single layer of mass loaded vinyl is field applied to the outer surface of the insulation and a second layer of mass loaded vinyl is adhered to metal jacketing with adhesive film.

1.2.1 Cut sections of mass loaded vinyl so that length is equal to the insulation system outer circumference plus a minimum of 5.1 cm (2 inches) – figures 3 and 13.

1.2.2 Wrap sections of mass loaded vinyl around insulation system. Place longitudinal joint between 2 to 4 o'clock for ease of access during next step. Overlap at longitudinal joint to be a minimum of 5.1 cm (2 inches) – figures 3 and 13.

FIGURE 3: Mass loaded vinyl (MLV) with required ≥5.1cm (2") longitudinal overlap. Joint located at 3 o'clock position with joint opening pointed downward to naturally shed water.

1.2.3 Secure longitudinal joint of mass loaded vinyl using tape or staples. Note that if a continuous vapor retarder is used on the outer surface of the insulation system, staples or any other fastener capable of piercing the vapor retarder shall not be used. Note that mass loaded vinyl joints only need to be secured sufficiently to hold it in place until the jacketing is applied and banded – figures 4 and 13.

FIGURE 4 – Mass loaded vinyl secured lightly with tape.

1.2.4 Apply successive sections of mass loaded vinyl so that circumferential joints abut tightly to the previous section of mass loaded vinyl. Overlap of mass loaded vinyl at circumferential joints is not required if the two pieces abut tightly – figure 13.

1.2.5 Apply outer layer of Muffl-Jac jacketing per 1.1.1 through 1.1.9.

1.2.6 Note that Muffl-Jac jacketing must be cut so that the length will fit over first layer of mass loaded vinyl with required 5.1 cm (2 inch) minimum overlap at the longitudinal joint – figure 5.

FIGURE 5 – Muffl-Jac jacketing cut to fit around first layer of mass loaded vinyl and yield the required ≥5.1 cm (2") longitudinal overlap.

1.2.7 Stagger the circumferential joints of the Muffl-Jac jacketing from the circumferential joints of the first layer of mass loaded vinyl so that the jacket joints fall about in the middle of the joints in the first layer of mass loaded vinyl – figure 16.

2. INSTALLATION OF MUFFL-JAC JACKETING ON ELBOWS

While Muffl-Jac jacketing can be beaded and crimped, the presence of the mass loaded vinyl prevents the bead and crimp from properly engaging so the circumferential joint between mitered sections is not water tight. Because of this, JM does not recommend that Muffl-Jac jacketing be applied to elbows as mitered sections (also called gores). Instead, one or more layers of mass loaded vinyl are applied to the elbow as mitered sections and then covered by either two-piece pressed elbows or mitered (gored) sections of metal jacketing which have been beaded and crimped.

2.1 Installation of a single layer of mass loaded vinyl – total mass of vinyl = 4.88 kg/m^2

2.1.1 Cut mitered sections (gores) of mass loaded vinyl so that the length is equal to the insulation system outer circumference plus a minimum of 1.3 cm (1/2 inch). The overlap of the mass loaded vinyl at the short longitudinal joint (usually located at about 3 o'clock on the elbow) only needs to be large enough to barely allow the joint to be secured with tape or staple. Too large an overlap can lead to problems with the fit of the metal jacketing mitered sections over the mass loaded vinyl – figures 6 and 14.

FIGURE 6: Mass loaded vinyl mitered sections (gores) cut to shape and length to fit around insulation with ≥1.3 cm (≥½ inch) longitudinal overlap.

2.1.2 Wrap sections of mass loaded vinyl around insulation system. Shape of mitered section typically requires short longitudinal joint to be located at 3 o'clock position on elbow – figures 7 and 14.

2.1.3 Successive mitered pieces of mass loaded vinyl should overlap at circumferential joints by a maximum of 1.3 cm (½ inches) and should have no gaps between mitered sections through which sound could travel – figures 7 and 14.

FIGURE 7: Mass loaded vinyl mitered sections (gores) placed around insulation with longitudinal joint at about 3 o'clock and with required ≥1.3 cm (≥½ inch) longitudinal overlap. Also shown is overlap at circumferential joint which is required to be a maximum of 1.3 cm (½ inch).

2.1.4 Secure longitudinal and circumferential joints of mass loaded vinyl using tape or staples. Note that if a continuous vapor retarder is used on the outer surface of the insulation system, staples or any other fastener capable of piercing the vapor retarder shall not be used. Note that mass loaded vinyl joints only need to be secured sufficiently to hold it in place until the jacketing is applied and secured – figures 8 and 14.

FIGURE 8: Tape or staples are used to lightly secure mass loaded vinyl mitered sections (gores) in place at both longitudinal and circumferential joints.

2.1.5 Apply two-piece pressed metal elbow – figures 9 and 17 – or mitered (gored) sections of metal jacketing which have been beaded and crimped using standard procedures – figures 10 and 15. Secure two piece pressed metal elbow or each mitered section (gore) using bands or screws.

FIGURE 9: Two piece pressed metal elbow shown being applied around mass loaded vinyl on elbow and secured with banding.

2.1.6 Two-piece pressed metal elbows must be chosen so that they will fit over the first layer of mass loaded vinyl with a minimum of 1.3 cm (½ inch) overlap at both longitudinal joints to allow insertion of securing screws at both joints.

2.1.7 Mitered (gored) sections of metal jacketing must be chosen or cut so that they will fit over first layer of mass loaded vinyl with a required minimum overlap of 1.3 cm (½ inch) at longitudinal joint which should be located at about 3 o'clock position on elbow – figures 10, 11, and 15.

FIGURE 10: Mitered metal jacket sections (gores) applied using standard bead/crimp at circumferential joint and ≥1.3 cm (≥½ inch) overlap at longitudinal joint which is located at about 3 o'clock.

2.2 Installation of a double layer of mass loaded vinyl – total mass of vinyl = 9.76 kg/m^2

2.2.1 Field install the first layer of mass loaded vinyl per sect ions 2.1.1 to 2.1.4

2.2.2 Field install a second layer of mass loaded vinyl per sections 2.1.1 to 2.1.4 but note that the mitered sections (gores) of mass loaded vinyl in this second layer must be cut to fit over the first layer of mass loaded vinyl.

2.2.3 Apply two-piece pressed metal elbow – figures 9 and 17 – or mitered (gored) sections of metal jacketing which have been beaded and crimped using standard procedures – figures 10 and 15. Secure two piece pressed metal elbow or each mitered section (gore) using bands or screws.

2.2.4 Note that two-piece pressed metal elbow or mitered (gored) sections of metal jacketing must be chosen or cut so that they will fit over the two layers of mass loaded vinyl with the required minimum overlaps at longitudinal joints specified in sections 2.1.6 or 2.1.7.

FIGURE 11: Finished mitered metal jacket sections (gores) applied to elbow over mass loaded vinyl.

Overlap Requirements for Mass Loaded Vinyl (MLV) and Muffl-Jac Jacketing

	Straight Pipe	
Acoustic Jacket System	Circumferential Joint	Longitudinal Joint
Muffl-Jac (1 layer of MLV adhered to metal jacketing)	≥5.1 cm (≥2 inches)	≥5.1 cm (≥2 inches)
MLV applied as a separate layer	0 – tightly abutted	≥5.1 cm (≥2 inches)
Metal Jacketing with no attached MLV	≥5.1 cm (≥2 inches)	≥5.1 cm (≥2 inches)
	Elbows	
Acoustic Jacket System	Circumferential Joint	Longitudinal Joint
Muffl-Jac (1 layer of MLV adhered to metal jacketing)	n.a.	n.a.
MLV applied as a separate layer	≤1.3 cm (≤½ inch) No gaps	≥1.3 cm (≥½ inches)
Metal Jacketing with no attached MLV	Standard Bead/Crimp	≥1.3 cm (≥ ½ inch)

FIGURE 12: Muffl-Jac Installation on Straight Pipe Insulation

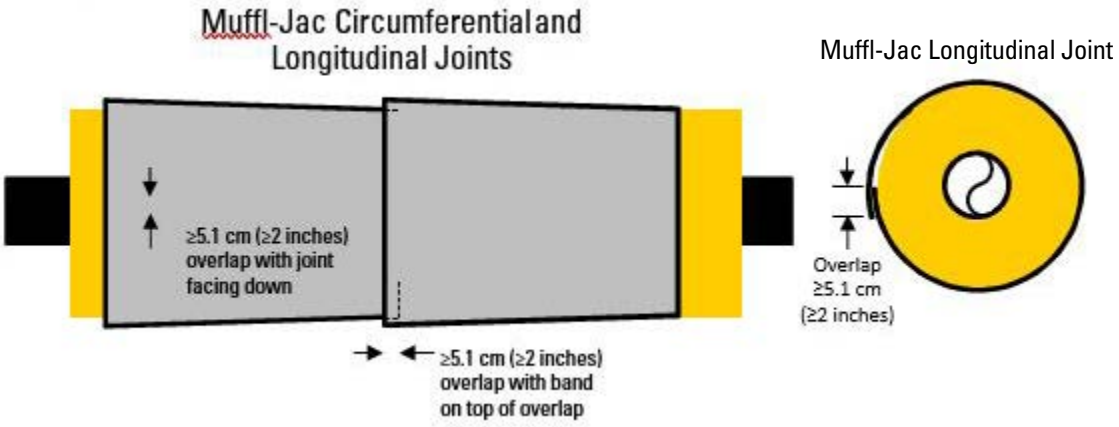

FIGURE 13: Mass Loaded Vinyl Installation on Straight Pipe Insulation

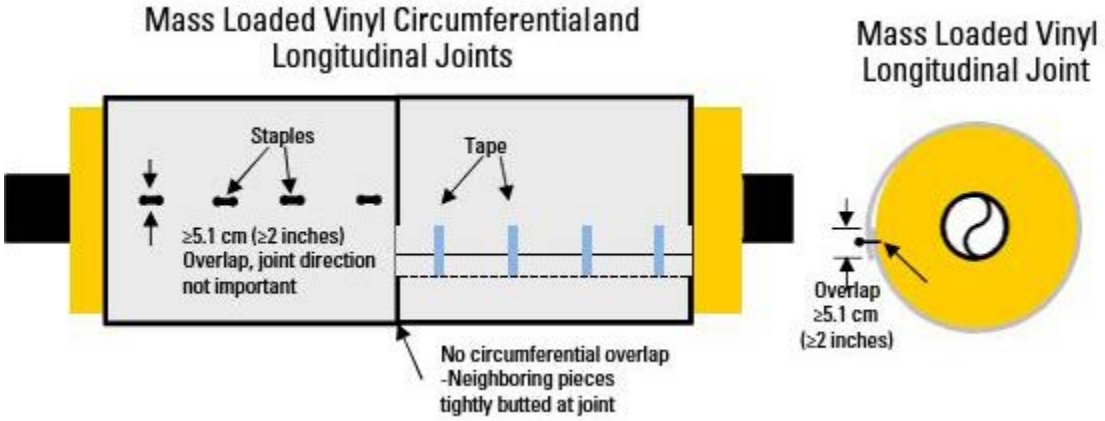

FIGURE 14: Mitered Mass Loaded Vinyl Section Installation on Elbow Insulation

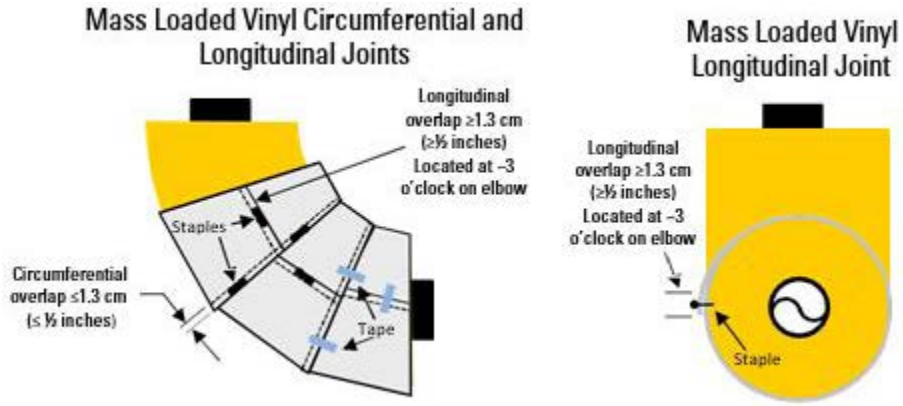

FIGURE 15: Mitered Metal Section Installation on Elbow Insulation

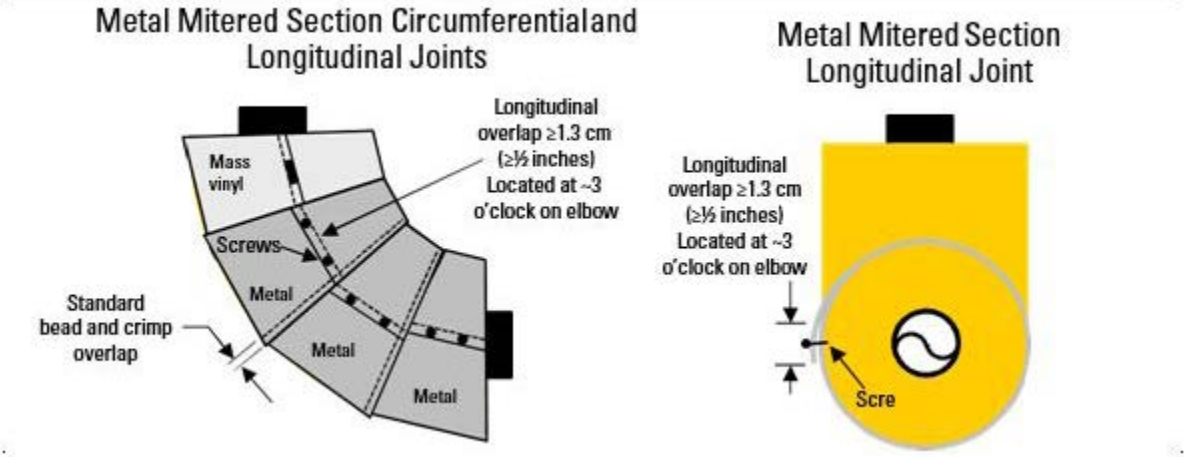

FIGURE 16: Staggering Circumferential Joints of Muffl-Jac from Circumferential Joints of Underlying Mass Loaded Vinyl on Straight Pipe Insulation

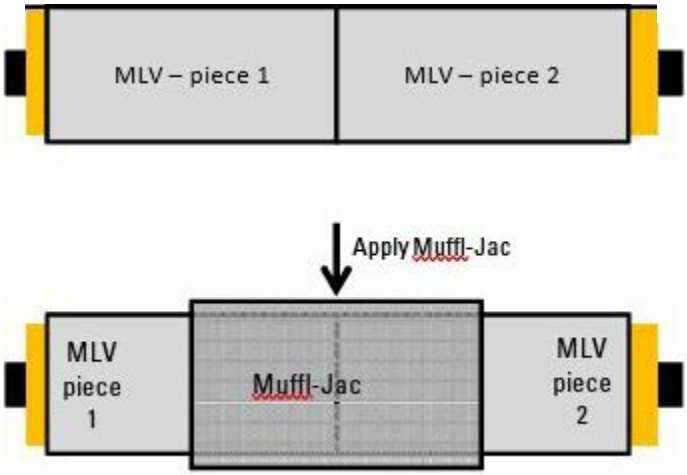

FIGURE 17: 2-Piece Metal Elbow Installation on Elbow Insulation