

SECTION 15084

JACKETING TAPES AND CLADDING FOR HVAC PIPING INSULATION

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**** NOTE TO SPECIFIER ** 3M; Insulation Jacketing Tapes.**

This section is based on the products of 3M Insulation Jacketing Tapes, which is located at:

3M Center Building 225-3S-06

St. Paul, MN 55144-1000

Toll Free Tel: 800-362-3550

Fax: 877-369-2923

Email: _____

Web: www.3m.com

[\[Click Here\]](#) for additional information.

3M™ VentureClad™ Jacketing Systems provide mechanical duct and pipe insulation protection while being cost effective. The self-adhering jacketing can be applied quickly and easily in a wide range of temperatures without any special tools. 3M™ VentureClad™ Jacketing Systems provide long-term reliability. They are an absolute vapor barrier, including the overlap seams, and provide a clean, professional finish while helping to prevent corrosion under insulation.

PART 1 GENERAL

1.1 SECTION INCLUDES

**** NOTE TO SPECIFIER ** Delete items below not required for project.**

- A. Insulation Jacketing Tapes:
 - 1. 3M VentureClad 1577 Series.
 - 2. 3M VentureClad 1579 Series.
 - 3. 3M VentureClad 1578CW.
- B. Insulation Jacketing Tapes:
 - 1. 3M Venture Tape FSK Facing Tape 1525CW .
 - 2. 3M Venture Tape Aluminum Foil Tape 1521CW .
 - 3. 3M Venture Tape Aluminum Foil Tape 1520CW.

1.2 RELATED SECTIONS

**** NOTE TO SPECIFIER ** Delete any sections below not relevant to this project; add others as required.**

- A. Section 15080 - Mechanical Insulation.
- B. Section 15081 - Jacketing Tapes for Plumbing Piping Insulation.
- C. Section 15082 - Jacketing Tapes for Duct Insulation.
- D. Section 15083 - Jacketing Tapes for HVAC Equipment Insulation.
- E. Section 15100 - Building Services Piping.

- F. Section 15140 - Water Piping.
- G. Section 15210 - Process Air and Gas Piping.
- H. Section 15220 - Process Water and Waste Piping.
- I. Section 15810 - Ducts.

1.3 REFERENCES

**** NOTE TO SPECIFIER **** Delete references from the list below that are not actually required by the text of the edited section.

- A. ASTM International (ASTM):
 - 1. ASTM C1338 - Standard Test Method for Determining Fungi Resistance of Insulation Materials and Facings.
 - 2. ASTM C1371 - Standard Test Method for Determination of Emittance of Materials Near Room Temperature Using Portable Emissometers.
 - 3. ASTM D1000 - Standard Test Methods for Pressure-Sensitive Adhesive-Coated Tapes Used for Electrical and Electronic Applications.
 - 4. ASTM D3330 - Standard Test Method for Peel Adhesion of Pressure-Sensitive Tape.
 - 5. ASTM D3652 - Standard Test Method for Thickness of Pressure-Sensitive Tapes.
 - 6. ASTM D3759 - Standard Test Method for Breaking Strength and Elongation of Pressure-Sensitive Tape.
 - 7. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
 - 8. ASTM E96 - Standard Test Methods for Water Vapor Transmission of Materials.
 - 9. ASTM E162 – Standard Test Method for Surface Flammability of Materials Using a Radiant Heat Energy Source.
 - 10. ASTM E662 – Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials.
 - 11. ASTM G155 – Standard Practice for Operating Xenon Arc Light Apparatus for Exposure of Non-Metallic Materials.
- B. British Standards (BS):
 - 1. BS 476-6 - Fire tests on building materials and structures. Method of test for fire propagation for products.
 - 2. BS 476-7 - Fire tests on building materials and structures. Method of test to determine the classification of the surface spread of flame of products.
- C. Canadian Food Inspection Agency.
- D. Committee Industrial Insulation Standards; Netherlands (CINI):
 - 1. CINI 3.3-12 - Aluminum polyester laminate tape / foil.
- E. German Institute for Standardization (DIN):
 - 1. DIN 4102 - Fire behavior of building materials and elements.
- F. International Building Code (IBC)
- G. International Code Council (ICC)
 - 1. ICC A117.1 - Standard for Accessible and Usable Buildings and Facilities.
- H. International Convention for the Safety of Life at Sea (SOLAS):
 - 1. SOLAS – Regulation II-2/3.

2. SOLAS – Regulation II-2/5.
 3. SOLAS – Regulation II-2/6.
- I. International Maritime Organization (IMO):
 1. IMO Resolution MSC61(67) Annex 1 Part 2 and Annex 2
 2. IMO Resolution MSC61(67) Annex 1 Part 5 and Annex 2
 3. IMO Resolution A653 (16)
 - J. Japanese Building Standard Law Article 2, Clause 9.
 - K. Netherland (CINI)
 1. CINI 3.3-12
 - L. New York City Building Code (NYBC)
 1. MEA 447-06M Approved
 - M. New York City School Construction Authority (NYCSCA)
 1. Specification 15413, 15512, 15513, and 15514
 - N. New York City MTA
 1. Meets NYC MTA requirements for insulation and jacketing.
 - O. South Africa Building Standard (BS)
 1. BS-SANS 10177 Part 3, Class 1
 - P. Underwriters Laboratories (UL):
 1. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials.
 - Q. Underwriters Laboratories Canada (ULC):
 1. ULC S102 - Standard Method of Test for Surface Burning Characteristics of building Materials and Assemblies.
 - R. United States Coast Guard (USCG):
 - S. United States Food and Drug administration (FDA):
 1. FDA 21 CFR 175.105 - Indirect Food Additives: Adhesives and Components of Coatings; Adhesives.
 2. FDA 21 CFR 175.125 - Indirect Food Additives: Adhesives and Components of Coatings; Pressure-sensitive adhesives.
 - T. Accepted for use by the Canadian Food Inspection Agency (CFIA).

1.4 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Product Data:
 1. Manufacturer's data sheets on each product to be used.
 2. Preparation instructions and recommendations.
 3. Storage and handling requirements and recommendations.
 4. Typical installation methods.

**** NOTE TO SPECIFIER ** Delete if not applicable to product type.**

- C. Verification Samples: Two representative units of each type, size, pattern and color.

- D. Shop Drawings: Include details of materials, construction and finish. Include relationship with adjacent construction.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with a minimum five years documented experience.

**** NOTE TO SPECIFIER ** 3M provides a training program for installers.**

- B. Installer Qualifications: Company specializing in performing Work of this section with minimum two years documented experience with projects of similar scope and complexity.

- C. Source Limitations: Provide each type of product from a single manufacturing source to ensure uniformity.

**** NOTE TO SPECIFIER ** Include mock-up if the project size or quality warrant the expense. The following is one example of how a mock-up on might be specified. When deciding on the extent of the mock-up, consider all the major different types of work on the project.**

- D. Mock-Up: Construct a mock-up with actual materials in sufficient time for Architect's review and to not delay construction progress. Locate mock-up as acceptable to Architect and provide temporary foundations and support.
1. Construct mockup following manufacturer's installation guidelines.
 2. Intent of mock-up is to demonstrate quality of workmanship and visual appearance.
 3. If mock-up is not acceptable, rebuild mock-up until satisfactory results are achieved.
 4. Retain mock-up during construction as a standard for comparison with completed work.
 5. Do not alter or remove mock-up until work is completed or removal is authorized.
 6. HVAC Piping Mockups:
 - a. One 10-foot (3-meter) section of straight pipe.
 - b. One each 90-degree threaded, welded, and flanged elbow.
 - c. One each threaded, welded, and flanged tee fitting.
 - d. One pressure temperature tap.
 - e. One small valve and one large valve.
 - f. One mechanical coupling.
 - g. Four support hangers including hanger shield and insert.

**** NOTES TO SPECIFIER ** Retain and edit the following if mockup of equipment is required.**

7. For each mockup, fabricate section to allow observation of application details for jacketing materials, adhesives, sealants, and tapes.
8. Notify Architect seven days in advance of dates and times when mockups will be constructed.
9. Obtain Architect's approval of mockups before starting insulation application.
10. Submit one copy of report to Architect describing tests, results, and any modifications made to correct deficiencies or to improve performance.
11. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
12. Mockup may remain part of the overall work and remain in place if approved by the Architect and manufacturer's technical field representative.

**** NOTES TO SPECIFIER ** Retain subparagraph above if mockup may be applied to the work. Otherwise, delete and retain the following 2 subparagraphs if the mockup may NOT be part to the work.**

13. Mockup shall not be a part of the finished work, but shall remain at the Project site protected during the work with weather-resistant jacket, and removed when directed, or upon completion of the work.

**** NOTES TO SPECIFIER ** Retain subparagraph below if mockups are not only for establishing appearance factors.**

14. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless specifically approved in writing by Architect of such deviations.

1.6 PRE-INSTALLATION CONFERENCE

- A. Convene a conference approximately two weeks before scheduled commencement of the Work. Attendees shall include Architect, Contractor and trades involved. Agenda shall include schedule, responsibilities, critical path items and approvals.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store and handle in strict compliance with manufacturer's written instructions and recommendations.
 1. Store in a clean, dry place. Temperature of 40 to 80 degrees F (4 to 26 degrees C) and 40 to 50 percent relative humidity are recommended.
- B. Protect from damage due to weather, excessive temperature, and construction operations.

1.8 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: 3M Insulation Jacketing Tapes, which is located at: 3M Center Building 225-3S-06; St. Paul, MN 55144-1000; ASD Toll Free Tel: 800-362-3550; Fax: 877-369-2923; Email: _____; Web: www.3m.com.

**** NOTE TO SPECIFIER ** Delete one of the following two paragraphs; coordinate with requirements of Division 1 section on product options and substitutions.**

- B. Substitutions: Not permitted.
- C. Requests for substitutions will be considered in accordance with provisions of Section 01600.

2.2 PERFORMANCE CRITERIA

- A. Surface-Burning Characteristics: For insulation jacketing and related materials when identical products are tested in accordance with ASTM E84 by a testing agency acceptable to authorities having jurisdiction. Factory label insulation jacketing, tapes, sealants, primers, adhesion promoters, cleaning solvents, and other accessories with appropriate markings of applicable testing agency.
 1. Refer to specific products for exact flame-spread indexes and smoke-developed indexes.

2.3 INSULATION JACKETING MATERIALS

**** NOTE TO SPECIFIER **** Select the following jacketing materials if the insulation cladding requires a zero permeable, exterior, aluminum coated insulation jacket. This product is applicable for use over foam glass, mineral fiber, nitrile, rubber and foam insulation; for interior and exterior use.

- A. Basis of Design: 3M VentureClad 1577CW as manufactured and supplied by 3M. A zero permeable, all weather, multi-layered laminate coated with a cold weather acrylic adhesive, resistance to weathering, fungi, UV and extreme environmental conditions.

**** NOTE TO SPECIFIER **** Retain the following codes and standards that apply to the project requirements.

1. Standards and Code Compliance:
 - a. International Code Council (ICC): ICC A117.1.

**** NOTE TO SPECIFIER **** Insert the applicable IBC for the project jurisdiction.

- b. International Building Code (IBC): _____.
 - c. International Maritime Organization (IMO).
 - 1) IMO Resolution A653(16).
 - 2) IMO Resolution MSC61(67), Annex 1, Part 2 and Annex 2.
 - 3) IMO Resolution MSC61(67) Annex 1, Part 5 and Annex 2.
 - d. Underwriters laboratory (UL): UL 723.
 - e. US Coast Guard Approval Number: 164.112/1121/WCL MED0285.
 - f. SOLAS – Regulation II-2/3.40.4
 - g. SOLAS – Regulation II-2/5.3.2.4
 - h. SOLAS – Regulation II-2/6.2
 - i. British Standards: BS 476.
 - j. German: DIN 4102-1.
 - k. Japanese Building Standard: Law Article 2, Clause 9.
 - l. European Norm (EN): EN 13501 – 1, 2007 with A1; 2009.
 - m. Netherland (CINI): CINI 3.3-12.
 - n. New York City Building Code (NYBC): MEA 447-06M Approved.
 - o. New York City School Construction Authority (NYCSCA): Specification 15413, 15512, 15513, and 15514.
 - p. New York City MTA: Meets NYC MTA requirements for insulation and jacketing.
 - q. South Africa Building Standard (BS): BS-SANS 10177 Part 3, Class 1.
 2. Thickness: 6 mils (0.16 mm), without release paper.
 3. Water Vapor Transmission Rate per ASTM E96: 0.00 perm.
 4. Fire, Flame, and Smoke Resistance:
 - a. Flame Spread per ASTM E84 and UL 723: 25.
 - b. Smoke Development per ASTM E84 and UL 723: 25.
 5. Peel Adhesion: 75 oz per inch (8.2 N per cm).
 6. Shear Strength: Greater than 72 hrs at 2.2 psi (15.2 kPa).
 7. Tensile Strength: 80 lbs per inch (140 N per cm).
 8. Puncture per ASTM D1000: 25 lbs (111.2 N).
 9. Elongation: 63 percent.
 10. Emittance per ASTM C1371: 0.03.
 11. Fungi Resistance per ASTM C1338: Passes.
 12. Service Temperature: Minus 94 to 300 degrees F (minus 70 to 149 degrees C).
 13. Application Temperature: Minus 10 degrees F (minus 23 degrees C).
 14. Surface Finish: Smooth.
 15. Color: Aluminum.
 16. Roll Widths: 4, 23, 35-1/2, and 46 inches (101.6, 584, 902, and 1168 mm).
 17. Roll Lengths: 50 yards (45.7 m).

**** NOTES TO SPECIFIER **** Select the following jacketing materials for stucco embossed surface finish, if the insulation cladding requires a zero permeable, exterior, aluminum coated insulation jacket. This product is applicable for use over foam glass, mineral fiber, nitrile, rubber and foam insulation; for interior and exterior use.

- B. Basis of Design: 3M VentureClad 1577CW-E for stucco embossed surface finish as manufactured and supplied by 3M. A zero permeable, all weather, multi-layered laminate coated with a cold weather acrylic adhesive, resistance to weathering, fungi, UV and extreme environmental conditions.

**** NOTES TO SPECIFIER **** Retain the following codes and standards that apply to the project requirements.

1. Standards and Code Compliance:
 - a. International Code Council (ICC): ICC A117.1.

**** NOTE TO SPECIFIER **** Insert the applicable IBC for the project jurisdiction.

- a. International Building Code (IBC): _____.
 - b. International Maritime Organization (IMO).
 - 1) IMO Resolution A653(16).
 - 2) IMO Resolution MSC61(67), Annex 1, Part 2 and Annex 2.
 - 3) IMO Resolution MSC61(67) Annex 1, Part 5 and Annex 2.
 - c. Underwriters Laboratory (UL): UL 723.
 - d. US Coast Guard Approval Number: 164.112/1121/WCL MED0285.
 - e. SOLAS – Regulation II-2/3.40.4.
 - f. SOLAS – Regulation II-2/5.3.2.4.
 - g. SOLAS – Regulation II-2/6.2.
 - h. British Standards: BS 476.
 - i. German: DIN 4102-1
 - j. Japanese Building Standard: Law Article 2, Clause 9.
 - k. European Norm (EN): EN 13501 - 1: 2007 with A1: 2009.
 - l. Netherland (CINI): CINI 3.3-12.
 - m. New York City Building Code (NYBC): MEA 447-06M Approved.
 - n. New York City School Construction Authority (NYCSCA): Specification 15413, 15512, 15513, and 15514.
 - o. New York City MTA: Meets NYC MTA requirements for insulation and jacketing.
 - p. South Africa Building Standard (BS): BS-SANS 10177 Part 3, Class 1.
 2. Thickness: 9.0 mils (0.23 mm), without release paper.
 3. Water Vapor Transmission Rate per ASTM E96: 0.00 perm.
 4. Fire, Flame, and Smoke Resistance:
 - a. Flame Spread per ASTM E84 and UL 723: 25.
 - b. Smoke Development per ASTM E84 and UL 723: 25.
 - c. Surface Flammability per ASTM E162: Zero.
 - d. Smoke Optical Density per ASTM E662: Zero.
 5. Peel Adhesion: 83 oz per inch (9.1 N per cm).
 6. Shear Strength: Greater than 72 hrs at 2.2 psi (15.2 kPa).
 7. Tensile Strength: 74 lbs per inch (130 N per cm).
 8. Puncture per ASTM D1000: 25 lbs (111.2 N).
 9. Elongation: 85 percent.
 10. Emittance per ASTM C1371: 0.03.
 11. Fungi Resistance per ASTM C1338: Passes.
 12. Service Temperature: Minus 94 to 300 degrees F (minus 70 to 149 degrees C).
 13. Application Temperature: Minus 10 degrees F (minus 23 degrees C).

14. Surface Finish: Embossed.
15. Color: Aluminum.
16. Roll Widths: 4, 23, 35-1/2, and 46 inches (101.6, 584, 902, and 1168 mm).
17. Roll Lengths: 50 yards (45.7 m).

**** NOTES TO SPECIFIER **** Select the following jacketing materials if the insulation cladding requires a zero permeable, exterior, white gloss coated insulation jacket. This product is applicable for use over foam glass, mineral fiber, nitrile, rubber and foam insulation; for interior and exterior use.

- C. Basis of Design: 3M VentureClad 1577CW-WM as manufactured and supplied by 3M. A zero permeable, all weather, multi-layered white laminate, coated with a cold weather acrylic adhesive, resistance to weathering, UV and extreme environmental conditions.

**** NOTES TO SPECIFIER **** Retain the following codes and standards that apply to the project requirements.

1. Standards and Code Compliance:
 - a. International Code Council (ICC): ICC A117.1.

**** NOTE TO SPECIFIER **** Insert the applicable IBC for the project jurisdiction.

- b. International Building Code (IBC): _____.
 - c. International Maritime Organization (IMO).
 - 1) IMO Resolution A653(16).
 - 2) IMO Resolution MSC61(67), Annex 1, Part 2 and Annex 2.
 - 3) IMO Resolution MSC61(67) Annex 1, Part 5 and Annex 2.
 - d. Underwriters laboratory (UL): ULC S102 Classified (Canada).
 - e. US Coast Guard Approval Number: 164.112/1121/WCL MED0290
 - f. SOLAS – Regulation II-2/3.40.5
 - g. SOLAS – Regulation II-2/5.3.2.4
 - h. SOLAS – Regulation II-2/6.2
 - i. British Standards: BS 476.
 - j. Meets FDA compositional requirements for indirect food contact; 21 CFR 175.105 and 21 CFR 175.125; FDA: Indirect food additives and components of coatings.
 - k. Accepted for use by the Canadian Food Inspection Agency (CFIA).
2. Thickness: 7.0 mils (0.18 mm), without release paper.
3. Water Vapor Transmission Rate per ASTM E96: 0.00 perm.
4. Fire, Flame, and Smoke Resistance:
 - a. Flame Spread per ASTM E84: 25.
 - b. Smoke Development per ASTM E84: 45.
5. Peel Adhesion: 80 oz per inch (8.8 N per cm).
6. Shear Strength: Greater than 72 hrs at 2.2 psi (15.2 kPa).
7. Tensile Strength: 108 lbs per inch (189 N per cm).
8. Puncture per ASTM D1000: 35 lbs (155.7 N).
9. Emittance per ASTM C1371: 0.80.
10. Service Temperature: Minus 94 to 248 degrees F (minus 70 to 120 degrees C).
11. Application Temperature: Minus 10 degrees F (minus 23 degrees C).
12. Surface Finish: Smooth.
13. Color: White.
14. Roll Widths: 4, 23, 35-1/2, and 46 inches (102, 584, 902, and 1168 mm).
15. Roll Lengths: 25 and 50 yards (22.86 and 45.7 m).

**** NOTES TO SPECIFIER **** Select the following jacketing materials for stucco embossed surface finish, if the insulation cladding requires a zero permeable, exterior, white gloss coated insulation jacket. This product is applicable for use over foam glass, mineral fiber, nitrile, rubber and foam insulation; for interior and exterior use.

- D. Basis of design: 3M VentureClad 1577CW-WME as manufactured and supplied by 3M. A zero permeable, all weather, multi-layered white laminate, coated with a cold weather acrylic adhesive, resistance to weathering, UV and extreme environmental conditions.

**** NOTES TO SPECIFIER ** Retain the following codes and standards that apply to the project requirements.**

1. Standards and Code Compliance:
 - a. International Code Council (ICC): ICC A117.1.

**** NOTE TO SPECIFIER ** Insert the applicable IBC for the project jurisdiction.**

- b. International Building Code (IBC): _____.
 - c. International Maritime Organization (IMO).
 - 1) IMO Resolution A653(16).
 - 2) IMO Resolution MSC61(67), Annex 1, Part 2 and Annex 2.
 - 3) IMO Resolution MSC61(67) Annex 1, Part 5 and Annex 2.
 - d. Underwriters laboratory (UL): ULC S102 Classified (Canada).
 - e. US Coast Guard Approval: 164.112/1121/WCL MED0290.
 - f. SOLAS – Regulation II-2/3.40.5
 - g. SOLAS – Regulation II-2/5.3.2.4
 - h. SOLAS – Regulation II-2/6.2
 - i. British Standards: BS 476.
 - j. Meets FDA compositional requirements for indirect food contact; 21 CFR 175.105 and 21 CFR 175.125; FDA: Indirect food additives and components of coatings.
 - k. Accepted for use by the Canadian Food Inspection Agency (CFIA).
2. Thickness: 9.0 mils (0.23 mm), without release paper.
3. Water Vapor Transmission Rate per ASTM E96: 0.00 perm.
4. Fire, Flame, and Smoke Resistance:
 - a. Flame Spread per ASTM E84: 25.
 - b. Smoke Development per ASTM E84: 45.
5. Peel Adhesion: 82 oz per inch (9.0 N per cm).
6. Shear Strength: Greater than 72 hrs at 2.2 psi (15.2 kPa).
7. Tensile Strength: 100 lbs per inch (175 N per cm).
8. Puncture per ASTM D1000: 33 lbs (147 N).
9. Emittance per ASTM C1371: 0.80.
10. Service Temperature: Minus 94 to 248 degrees F (minus 70 to 120 degrees C).
11. Application Temperature: Minus 10 degrees F (minus 23 degrees C).
12. Surface Finish: Stucco embossed.
13. Color: White.
14. Roll Widths: 4, 23, 35-1/2, and 46 inches (102, 584, 902, and 1168 mm).
15. Roll Lengths: 25 and 50 yards (22.86 and 45.7 m).

**** NOTES TO SPECIFIER ** Select the following jacketing materials if the insulation cladding requires an extra heavy duty (thicker) zero permeable, exterior, aluminum coated insulation jacket. This product is applicable for use over foam glass, mineral fiber, nitrile, rubber and foam insulation; for interior and exterior use.**

- E. Basis of Design: 3M VentureClad 1579GCW as manufactured and supplied by 3M. A zero permeable, extra heavy duty, all weather, multi-layered, reinforced, laminate coated with a cold weather acrylic adhesive, resistance to weathering, UV and extreme environmental conditions.

**** NOTES TO SPECIFIER ** Retain the following codes and standards that apply to the project requirements.**

1. Standards and Code Compliance:
 - a. International Code Council (ICC): ICC A117.1.
 - b. International Building Code (IBC): _____.
 - c. International Maritime Organization (IMO).
 - 1) IMO Resolution A653(16).
 - 2) IMO Resolution MSC61(67), Annex 1, Part 2 and Annex 2.
 - 3) IMO Resolution MSC61(67) Annex 1, Part 5 and Annex 2.
 - d. US Coast Guard Approval: 164.112/1121/WCL MED0381.
 - e. SOLAS – Regulation II-2/3
 - f. SOLAS – Regulation II-2/5
 - g. SOLAS – Regulation II-2/6
 - h. SOLAS – Regulation II-X/3
2. Thickness: 15.0 mils (0.38 mm), without release paper.
3. Water Vapor Transmission Rate per ASTM E96: 0.00 perm.
4. Fire, Flame, and Smoke Resistance:
 - a. Flame Spread per ASTM E84: 10.
 - b. Smoke Development per ASTM E84: 10.
 - c. Flame Spread per UL 723: 25.
 - d. Smoke Development UL 723: 60.
5. Peel Adhesion: 87 oz per inches (9.3 N per cm).
6. Shear Strength: Greater than 72 hrs at 2.2 psi (15.2 kPa).
7. Tensile Strength: 155 lbs per inch (271 N per cm).
8. Puncture per ASTM D1000: 41 lbs (182 N).
9. Elongation: 70 percent.
10. Emittance per ASTM C1371: 0.03.
11. Service Temperature: Minus 94 to 300 degrees F (minus 70 to 149 degrees C).
12. Application Temperature: Minus 10 degrees F (minus 23 degrees C).
13. Surface Finish: Smooth.
14. Color: Aluminum.
15. Roll Widths: 23, 35-1/2, and 46 inches (584, 902, 1168 mm).
16. Roll Length: 25 yards (22.86 m).

**** NOTES TO SPECIFIER **** Select the following jacketing materials for stucco embossed surface finish, if the insulation cladding requires an extra heavy duty (thicker) zero permeable, exterior, aluminum coated insulation jacket. This product is applicable for use over foam glass, mineral fiber, nitrile, rubber and foam insulation; for interior and exterior use.

- F. Basis of Design: 3M VentureClad 1579GCW-E as manufactured and supplied by 3M. A zero permeable, extra heavy duty, all weather, multi-layered, reinforced, laminate coated with a cold weather acrylic adhesive, resistance to weathering, UV and extreme environmental conditions.

**** NOTES TO SPECIFIER **** Retain the following codes and standards that apply to the project requirements.

1. Standards and Code Compliance:
 - a. International Code Council (ICC): ICC A117.1.
 - b. International Building Code (IBC): _____.
 - c. International Maritime Organization (IMO).
 - 1) IMO Resolution A653(16).
 - 2) IMO Resolution MSC61(67), Annex 1, Part 2 and Annex 2.
 - 3) IMO Resolution MSC61(67) Annex 1, Part 5 and Annex 2.

**** NOTE TO SPECIFIER **** Insert the applicable IBC for the project jurisdiction.

- d. US Coast Guard Approval: 164.112/1121/WCL MED0381.
- e. SOLAS – Regulation II-2/3
- f. SOLAS – Regulation II-2/5
- g. SOLAS – Regulation II-2/6
- h. SOLAS – Regulation II-X/3
- 2. Thickness: 16.0 mils (0.4 mm), without release paper.
- 3. Water Vapor Transmission Rate per ASTM E96: 0.00 perm.
- 4. Fire, Flame, and Smoke Resistance:
 - a. Flame Spread per ASTM E84: 10.
 - b. Smoke Development per ASTM E84: 10.
- 5. Peel Adhesion: 73 oz per inches (8.0 N per cm).
- 6. Shear Strength: Greater than 72 hrs at 2.2 psi (15.2 kPa).
- 7. Tensile Strength: 149 lbs per inch (261 N per cm).
- 8. Puncture per ASTM D1000: 68 lbs (302 N).
- 9. Elongation: 60 percent.
- 10. Emittance per ASTM C1371: 0.03.
- 11. Service Temperature: Minus 94 to 300 degrees F (minus 70 to 149 degrees C).
- 12. Application Temperature: Minus 10 degrees F (minus 23 degrees C).
- 13. Surface Finish: Stucco embossed.
- 14. Color: Aluminum.
- 15. Roll Widths: 23, 35-1/2, and 46 inches (584, 902, 1168 mm).
- 16. Roll Length: 25 yards (22.86 m).

**** NOTES TO SPECIFIER **** Select the following jacketing materials if the insulation cladding requires an extra heavy duty (thicker) zero permeable, multi-layered white laminate insulation jacket. This product is applicable for use over foam glass, mineral fiber, nitrile, rubber and foam insulation; for interior and exterior use.

- G. Basis of Design: 3M VentureClad 1579GCW-WM as manufactured and supplied by 3M. A zero permeable, extra heavy duty, all weather, multi-layered White laminate coated with a cold weather acrylic adhesive, resistance to weathering, UV and extreme environmental conditions.

**** NOTES TO SPECIFIER **** Retain the following codes and standards that apply to the project requirements.

- 1. Standards and Code Compliance:
 - a. International Code Council (ICC): ICC A117.1.
- b. International Building Code (IBC): _____.
- c. International Maritime Organization (IMO).
 - 1) IMO Resolution A653(16).
 - 2) IMO Resolution MSC61(67), Annex 1, Part 2 and Annex 2.
 - 3) IMO Resolution MSC61(67) Annex 1, Part 5 and Annex 2.
- d. US Coast Guard Approval: 164.112/1121/WCL MED0381.
- e. SOLAS – Regulation II-2/3
- f. SOLAS – Regulation II-2/5
- g. SOLAS – Regulation II-2/6
- h. SOLAS – Regulation II-X/3
- 2. Thickness: 15 mils (0.38 mm), without release paper.
- 3. Water Vapor Transmission Rate per ASTM E96: 0.00 perm.
- 4. Fire, Flame, and Smoke Resistance:
 - a. Flame Spread per ASTM E84: 20.
 - b. Smoke Development per ASTM E84: 30.

5. Peel Adhesion: 102 oz per inch (27.8 N per cm).
6. Shear Strength: Greater than 72 hrs at 2.2 psi (15.2 kPa).
7. Tensile Strength: 184 lbs per inch (322 N per cm).
8. Puncture per ASTM D1000: 55 lbs (244 N).
9. Elongation: 64 percent.
10. Emittance per ASTM C1371: 0.80.
11. Service Temperature: Minus 94 to 248 degrees F (minus 70 to 120 degrees C).
12. Application Temperature: Minus 10 degrees F. (minus 23 degrees C).
13. Surface Finish: Smooth.
14. Color: White.
15. Roll Widths: 23, 35-1/2, and 46 inches (584, 902, and 1168 mm).
16. Roll Lengths: 25 yards (22.86 m).

**** NOTES TO SPECIFIER **** Select the following jacketing materials for stucco embossed surface finish, if the insulation cladding requires an extra heavy duty (thicker) zero permeable, multi-layered white laminate insulation jacket. This product is applicable for use over foam glass, mineral fiber, nitrile, rubber and foam insulation; for interior and exterior use.

- H. Basis of Design: 3M VentureClad 1579GCW-WME as manufactured and supplied by 3M. A zero permeable, extra heavy duty, all weather, multi-layered White laminate coated with a cold weather acrylic adhesive, resistance to weathering, UV and extreme environmental conditions.

**** NOTES TO SPECIFIER **** Retain the following codes and standards that apply to the project requirements.

1. Standards and Code Compliance:
 - a. International Code Council (ICC): ICC A117.1.

**** NOTE TO SPECIFIER **** Insert the applicable IBC for the project jurisdiction.

- b. International Building Code (IBC): _____.
 - c. International Maritime Organization (IMO).
 - 1) IMO Resolution A653(16).
 - 2) IMO Resolution MSC61(67), Annex 1, Part 2 and Annex 2.
 - 3) IMO Resolution MSC61(67) Annex 1, Part 5 and Annex 2.
 - d. US Coast Guard Approval: 164.112/1121/WCL MED0381.
 - e. SOLAS – Regulation II-2/3
 - f. SOLAS – Regulation II-2/5
 - g. SOLAS – Regulation II-2/6
 - h. SOLAS – Regulation II-X/3
2. Thickness: 16 mils (0.4 mm), without release paper.
3. Water Vapor Transmission Rate per ASTM E96: 0.00 perm.
4. Fire, Flame, and Smoke Resistance:
 - a. Flame Spread per ASTM E84: 20.
 - b. Smoke Development per ASTM E84: 30.
5. Peel Adhesion: 126 oz per inch (13.8 N per cm).
6. Shear Strength: Greater than 72 hrs at 2.2 psi (15.2 kPa).
7. Tensile Strength: 184 lbs per inch (322 N per cm).
8. Puncture per ASTM D1000: 55 lbs (244 N).
9. Elongation: 64 percent.
10. Emittance per ASTM C1371: 0.80.
11. Service Temperature: Minus 94 to 248 degrees F (minus 70 to 120 degrees C).
12. Application Temperature: Minus 10 degrees F. (minus 23 degrees C).
13. Surface Finish: Stucco embossed.
14. Color: White.

15. Roll Widths: 23, 35-1/2, and 46 inches (584, 902, and 1168 mm).
16. Roll Lengths: 25 yards (22.86 m).

2.4 INSULATION JACKETING TAPES

**** NOTES TO SPECIFIER **** The product below is ideal for sealing applications for fiberglass ductboards, FSK-faced duct wrap and sheet metal duct joints and mineral wool thermal insulation. Also used as a vapor seal for reinforced aluminum faced fiberglass or mineral wool thermal insulation. Applicable for indoor or outdoor use and for low and high temperature applications. Delete if not required.

- A. Basis of Design: 3M Venture Tape FSK Facing Tape 1525CW as manufactured and supplied by 3M. A foil/scrim/kraft (FSK) lamination coated with a cold weather solvent acrylic pressure sensitive adhesive tape.
1. Certifications:
 - a. Flame and Smoke Rating Classification per UL723: UL File No. R10984.
 - 1) Flame: 10.
 - 2) Smoke: 10.
 - b. Flame and Smoke Rating Classification per CAN/ULC S102:
 - 1) Flame: 10.
 - 2) Smoke: 10.
 - c. Facing meets ASTM C1136, Type II and IV.
 2. Bonds and seals at temperatures down to minus 10 degrees F (minus 23 degrees C).
 3. Cold weather adhesive performs well over a wide temperature range.
 4. Excellent performance in demanding heat and humidity conditions.
 5. Conforms well to irregular surfaces.
 6. Adhesive: Acrylic.
 7. Color: Natural aluminum.
 8. Liner: Release liner.
 9. Total Tape Thickness per ASTM D3652: 5.5 mil (0.14 mm).
 10. Backing Thickness per ASTM D3652: 4 mil (0.1 mm).
 11. Backing: FSK.
 12. Peel Adhesion per ASTM D3330: 66 oz per in (7.2 N per cm).
 13. Tensile Strength per ASTM D3759: 39 lb per in (68.3 N per cm).
 14. Elongation per ASTM D3759: 2 percent.
 15. Service Temperature: Minus 40 to 240 degrees F (minus 40 to 116 degrees C).

Note to Editor: Disks and squares are also available. Contact 3M for sizes.

16. Roll Widths: 3 inches, 4 inches, 5 inches (76 mm, 101 mm, 127 mm).
17. Roll Lengths: 50 yards (45.7 m).

**** NOTE TO SPECIFIER **** The product below is ideal for fibrous and sheet metal ducts. Also used as a vapor seal for reinforced fiberglass and mineral wool insulation, and seam and joint sealing on sheet metal and fibrous ductwork. Delete if not required.

- B. Basis of Design: 3M Venture Tape Aluminum Foil Tape 1521CW as manufactured and supplied by 3M. A high strength dead soft aluminum foil coated with a cold weather acrylic pressure sensitive adhesive.
1. Certifications:
 - a. Flame and Smoke Rating Classification per UL723: UL File No. R10984.
 - 1) Flame: 10.
 - 2) Smoke: 10.
 - b. U.S. Coast Guard Approved: CGA No. 164.112/63/0
 2. Excels in demanding temperature and humidity applications.
 3. Conforms well to curved and irregular surfaces.
 4. Specifically designed for cold weather conditions.

5. Hand tearable and easy to install.
6. Adhesive: Acrylic.
7. Color: Natural aluminum
8. Liner: Release liner.
9. Total Tape Thickness per ASTM D3652: 2.8 mil (0.07 mm).
10. Backing Thickness per ASTM D3652: 1.4 mil (0.04 mm).
11. Backing: Aluminum foil.
12. Peel Adhesion per ASTM D3330: 46 oz per in (5 N per cm).
13. Tensile Strength per ASTM D3759: 15 lb per in (26.3 N per cm).
14. Elongation per ASTM D3759: 4 percent.
15. Service Temperature: Minus 40 to 250 degrees F (minus 40 to 121 degrees C).

**** NOTE TO SPECIFIER **** The product below is ideal for fiberglass ductboard, sheet metal duct joints, blankets, and for taping FSK systems. It is applicable for indoor or outdoor use and for low and high temperature applications. Tape is malleable for use around corners and irregular surfaces. A general purpose foil tape for a variety of applications. Delete if not required.

- C. Basis of Design: 3M Venture Tape Aluminum Foil Tape 1520CW as manufactured and supplied by 3M. A high strength dead soft aluminum foil tape coated with a cold weather acrylic pressure sensitive adhesive.
1. Certifications:
 - a. Flame and Smoke Rating Classification per UL723: UL File No. R10984.
 - 1) Flame: 10.
 - 2) Smoke: 10.
 - b. Flame and Smoke Rating Classification per CAN/ULC S102:
 - 1) Flame: 10.
 - 2) Smoke: 10.
 - c. U.S. Coast Guard Approved: 164.112/1121/WCL MED0287.
 - d. SOLAS – Regulation II-2/3.40.5.
 - e. SOLAS – Regulation II-2/5.3.2.4.
 - f. SOLAS – Regulation II-2/6.2.
 2. Bonds and seals down to minus 10 degrees F (minus 23 degrees C).
 3. Excels in demanding temperature and humidity applications.
 4. Conforms well to curved and irregular surfaces.
 5. Specifically designed for cold weather conditions.
 6. Hand tearable.
 7. Adhesive: Acrylic.
 8. Color: Natural aluminum
 9. Liner: Release liner.
 10. Total Tape Thickness per ASTM D3652: 3.2 mil (0.08 mm).
 11. Backing Thickness per ASTM D3652: 1.8 mil (0.05 mm).
 12. Backing: Aluminum foil.
 13. Peel Adhesion per ASTM D3330: 51 oz per in (5.6 N per cm).
 14. Tensile Strength per ASTM D3759: 21 lb per in (36.8 N per cm).
 15. Elongation per ASTM D3759: 9 percent.
 16. Service Temperature: Minus 40 to 260 degrees F (minus 40 to 127 degrees C).
 17. Roll Widths: 2, 3, and 4 inches (51, 76, and 100 mm).
 18. Roll Lengths: 50 yards (45.7 m).

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with installer present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance.
 - 1. Verify that items scheduled to receive jacketing have been tested and are free of defects that prevent adhesion and proper installation of jacketing.
 - 2. Verify that surfaces to receive jacketing are clean and dry, free of dust, dirt, contaminants, oils, grease, etc.
- B. If substrate preparation is the responsibility of another installer, notify Architect in writing of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions, approved submittals and in proper relationship with adjacent construction.
- B. Install jackets compatible with insulation materials and suitable for the service. Install jackets that do not corrode, soften, or otherwise attack insulation in either wet or dry state.
- C. For insulation with factory-applied jacket, install the field-applied jacket over the factory-applied jacket.
- D. If more than one jacketing material is specified, selection from materials specified is Contractor's option.
- E. Install jackets at thicknesses specified for each item of pipe [and equipment] system as specified in insulation system schedules.
- F. Install jacketing materials, accessories, and tapes with smooth, straight, and even surfaces; free of voids, bubbles, and open edges throughout the length of piping including fittings, valves, and specialties.
- G. Keep jacket materials dry during application and finishing.
- H. Install jacketing with least number of joints practical, and with tight overlapping seams and end joints. Tape seams and joints with specified or manufacturers' recommended tapes.
 - 1. Install jacketing continuously around hanger and anchor attachments.
 - 2. Extend jacketing and taping onto anchor legs from point of attachment to supported item to point of attachment to structure. Tape and seal ends at attachment to structure with vapor-barrier mastic.
 - 3. Overlap jacketing to ensure water-shedding.
- I. Where vapor barrier is required, tape joints, seams, and penetrations at hangers, supports, anchors, and other projections with vapor-barrier tapes.
 - 1. Cover joints with tape strips of same material as, or compatible with jacketing in accordance with manufacturer's requirements.
 - 2. Clean and dry surface to receive self-sealing lap.
 - 3. Overlap jacket seams at least 1-1/2 inches (38 mm).

- 4. Overlap jacketing to ensure water-shedding.
- J. Cut jacketing in a manner to avoid compressing insulation.
- K. Repair damaged jacket facings by applying same facing material over damaged areas. Extend patches at least 4 inches (100 mm) beyond damaged areas.
- L. Do not install jacketing to the following:
 - 1. Vibration-control devices.
 - 2. Testing agency labels and stamps.
 - 3. Nameplates and data plates.
 - 4. Cleanouts.

3.4 FIELD QUALITY CONTROL

**** NOTES TO SPECIFIER **** Inspections in this article are destructive. Retain if workmanship quality is an important requirement. Architect should be prepared to reject all work if defective work is discovered in sample inspection.

- A. Perform specified tests and inspections.
- B. Tests and Inspections: Inspect equipment, pipes, fittings, strainers, and valves, randomly selected by Architect, by removing field-applied jacket and insulation in layers in reverse order of their installation.
- C. All insulation jacketing and taping applications will be considered defective Work if sample inspection reveals noncompliance with specified requirements and manufacturer's requirements.

3.5 CLEANING AND PROTECTION

- A. Clean products in accordance with the manufacturers recommendations.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION