Aeroflex USA, Inc. June 2025

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Guide Specification

Specifier Notes: This guide specification is written in Construction Specifications Institute (CSI) 3-Part Format in accordance with *The CSI Construction Specifications Practice Guide,* *MasterFormat, SectionFormat,* and *PageFormat.*

This Section must be carefully reviewed and edited by the Architect to meet the requirements of the Project and local building code. Coordinate this Section with Conditions of the Contract, Division 01, other specification sections, and the Drawings. Delete all Specifier Notes after editing this Section.

Section numbers and titles are based on *CSI MasterFormat 2018 Edition.*

1. 23 07 13

DUCT INSULATION

Specifier Notes: This Section covers Aeroflex USA, Inc. HVAC duct insulation. Consult Aeroflex USA, Inc. for assistance in editing this Section as required for the Project.

* 1. GENERAL
     1. SECTION INCLUDES
        1. HVAC duct insulation.
     2. RELATED REQUIREMENTS

Specifier Notes: Edit the following list of related sections as required for the Project. Limit the list to sections with specific information that the reader might expect to find in this Section but is specified elsewhere.

* + - 1. Section 23 07 16 – HVAC Equipment Insulation.
      2. Section 23 07 19 – HVAC Piping Insulation.
      3. Section 23 31 00 – HVAC Ducts and Casings.
    1. REFERENCE STANDARDS

Specifier Notes: List reference standards used elsewhere in this Section, complete with designations and titles. Delete reference standards from the following list not used in the edited Section.

* + - 1. ASTM International (ASTM) ([www.astm.org](http://www.astm.org)):
         1. ASTM C 177 – Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus.
         2. ASTM C 209 – Standard Test Methods for Cellulosic Fiber Insulating Board.
         3. ASTM C 356 – Standard Test Method for Linear Shrinkage of Preformed High-Temperature Thermal Insulation Subjected to Soaking Heat.
         4. ASTM C 411 – Standard Test Method for Hot-Surface Performance of High-Temperature Thermal Insulation.
         5. ASTM C 423 – Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.
         6. ASTM C 518 – Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
         7. ASTM C 534 / C 534M – Standard Specification for Preformed Flexible Elastomeric Cellular Thermal Insulation in Sheet and Tubular Form.
         8. ASTM C 665 – Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.
         9. ASTM C 692 – Standard Test Method for Evaluating the Influence of Thermal Insulations on External Stress Corrosion Cracking Tendency of Austenitic Stainless Steel.
         10. ASTM C 1071 – Standard Specification for Fibrous Glass Duct Lining Insulation (Thermal and Sound Absorbing Material).
         11. ASTM C 1304 – Standard Test Method for Assessing the Odor Emission of Thermal Insulation Materials.
         12. ASTM C 1338 – Standard Test Method for Determining Fungi Resistance of Insulation Materials and Facings.
         13. ASTM C 1371 – Standard Test Method for Determination of Emittance of Materials Near Room Temperature Using Portable Emissometers.
         14. ASTM C 1534 – Standard Specification for Flexible Polymeric Foam Sheet Insulation Used as a Thermal and Sound Absorbing Liner for Duct Systems.
         15. ASTM D 256 – Standard Test Methods for Determining the Izod Pendulum Impact Resistance of Plastics.
         16. ASTM D 412 – Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers—Tension.
         17. ASTM D 635 – Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position.
         18. ASTM D 785 – Standard Test Method for Rockwell Hardness of Plastics and Electrical Insulating Materials.
         19. ASTM D 792 – Standard Test Methods for Density and Specific Gravity (Relative Density) of Plastics by Displacement.
         20. ASTM D 882 – Standard Test Method for Tensile Properties of Thin Plastic Sheeting.
         21. ASTM D 1000 – Standard Test Methods for Pressure-Sensitive Adhesive-Coated Tapes Used for Electrical and Electronic Applications.
         22. ASTM D 1056 – Standard Specification for Flexible Cellular Materials—Sponge or Expanded Rubber.
         23. ASTM D 1171 – Standard Test Method for Rubber Deterioration—Surface Ozone Cracking Outdoors (Triangular Specimens).
         24. ASTM D 1621 – Standard Test Method for Compressive Properties of Rigid Cellular Plastics.
         25. ASTM D 1667 – Standard Specification for Flexible Cellular Materials—Poly (Vinyl Chloride) Foam (Closed-Cell).
         26. ASTM D 3121 – Standard Test Method for Tack of Pressure-Sensitive Adhesives by Rolling Ball.
         27. ASTM D 3330 / D 3330M – Standard Test Method for Peel Adhesion of Pressure-Sensitive Tape.
         28. ASTM D 3611 – Standard Practice for Accelerated Aging of Pressure-Sensitive Tapes.
         29. ASTM D 3654 / D 3654M – Standard Test Methods for Shear Adhesion of Pressure-Sensitive Tapes.
         30. ASTM D 3816 / D 3816M – Standard Test Method for Water Penetration Rate of Pressure-Sensitive Tapes.
         31. ASTM D 3960 – Standard Practice for Determining Volatile Organic Compound (VOC) Content of Paints and Related Coatings.
         32. ASTM E 84 – Standard Test Method for Surface Burning Characteristics of Building Materials.
         33. ASTM E 96 – Standard Test Methods for Water Vapor Transmission of Materials.
         34. ASTM G 7 / G 7M – Standard Practice for Atmospheric Environmental Exposure Testing of Nonmetallic Materials.
         35. ASTM G 21 – Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi.
      2. British Standards Institution (BSI) (www.bsigroup.com):
         1. BS EN 12868 – Child use and care articles — Method for determining the release of N-nitrosamines and N-nitrosatable substances from elastomer or rubber teats and soothers.
      3. German Institute for Standardisation (DIN):
         1. DIN 1988 – Codes of practice for drinking water installations.
      4. International Mechanical Code (IMC):
         1. Pipe and duct insulation within plenums - listed and labeled.
      5. Japanese Standards Association (JSA):
         1. JIS K 6301 – Physical Testing Methods for Vulcanized Rubber.
      6. National Fire Protection Association (NFPA) (www.nfpa.org):
         1. NFPA 90A – Standard for the Installation of Air-Conditioning and Ventilating Systems.
         2. NFPA 90B – Standard for the Installation of Warm Air Heating and Air-Conditioning Systems.
      7. New York City Department of Buildings, Materials and Equipment Acceptance (MEA) Division (www1.nyc.gov):
         1. MEA 171-04-M.
      8. Pressure Sensitive Tape Council (PSTC) (www.pstc.org):
         1. PSTC-5 – Quick Stick of Pressure Sensitive Tapes.
         2. PSTC-101 – International Standard for Peel Adhesion of Pressure Sensitive Tape.
         3. PSTC-107 – International Standard for Shear Adhesion of Pressure Sensitive Tape.
         4. PSTC-131 – International Breaking Strength and Elongation of Pressure Sensitive Tapes.
         5. PSTC-133 – International Thickness (Caliper) of Pressure Sensitive Tapes.
      9. RoHS Directive 2002/95/EC – Restriction of Hazardous Substances.
      10. South Coast Air Quality Management District (SCAQMD) (www.aqmd.gov):
          1. SCAQMD Rule 1168 – Adhesive and Sealant Applications.
          2. SCAQMD Rule 1113 – Architectural Coating Applications.
      11. State of California (CA):
          1. CDPH Method v1.2 (CA Section 01350) – Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers.
      12. UL ([www.ul.com](http://www.ul.com)):
          1. CAN/ULC-S102 – Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.
          2. UL 94 – Standard for Tests for Flammability of Plastic Materials for Parts in Devices and Appliances.
          3. UL 181 – Standard for Factory-Made Air Ducts and Air Connectors.
          4. UL 723 – Standard for Test for Surface Burning Characteristics of Building Materials.
      13. US Environmental Protection Agency (US EPA) ([www.epa.gov](http://www.epa.gov)):
          1. Method 3052 – Microwave Assisted Acid Digestion of Siliceous and Organically Based Matrices.
          2. Method 3060A – Alkaline Digestion for Hexavalent Chromium.
          3. Method 3540C – Soxhlet Extraction.
          4. Method 6010B – Inductively Coupled Plasma-Atomic Emission Spectrometry.
          5. Method 7196A – Chromium, Hexavalent (Colorimetric).
          6. Method 8270C – Semi volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS).
      14. US Food and Drug Administration (US FDA) (www.fda.gov):
          1. US FDA CPG 7117.11 – Compliance Policy Guide Sec. 500.450 Volatile N-Nitrosamines in Rubber Baby Bottle Nipples.
    1. PREINSTALLATION MEETINGS

Specifier Notes: Edit the Preinstallation Meetings article as required for the Project. Delete this article if not required.

* + - 1. Convene preinstallation meeting [1 week] [2 weeks] before start of installation of HVAC duct insulation.
      2. Require attendance of parties directly affecting Work of this Section, including Contractor, Architect, installer, and manufacturer’s representative.
      3. Review the Following:
         1. Materials.
         2. Examination of HVAC ducts.
         3. Surface preparation.
         4. Installation.
         5. Adjusting.
         6. Cleaning.
         7. Protection.
         8. HVAC duct insulation schedule.
         9. Coordination with other Work.
    1. SUBMITTALS

Specifier Notes: Edit the Submittals article as required for the Project. Delete submittals not required.

* + - 1. Submittals: Comply with Division 01.
      2. Product Data: Submit manufacturer’s product data, including installation instructions.
      3. Samples: Submit manufacturer’s standard sample of each type of HVAC duct insulation specified.
      4. Manufacturer’s Certification: Submit manufacturer’s certification that materials comply with specified requirements and are suitable for intended application.
      5. Test Reports: Submit manufacturer’s test reports from testing performed by qualified, independent testing laboratories.
      6. Manufacturer’s Project References: Submit manufacturer’s list of 10 successfully completed HVAC duct insulation projects of similar size and scope to this Project, including project name and location, name of architect, and type and quantity of HVAC duct insulation furnished.
      7. Installer’s Project References: Submit installer’s list of 10 successfully completed HVAC duct insulation projects of similar size and scope to this Project, including project name and location, name of architect, and type and quantity of HVAC duct insulation installed.
      8. Warranty Documentation: Submit manufacturer’s standard warranty.
    1. QUALITY ASSURANCE
       1. Manufacturer’s Qualifications: Manufacturer regularly engaged in the manufacturing of HVAC duct insulation of similar type to that specified for a minimum of 10 years.
       2. Installer's Qualifications:
          1. Installer regularly engaged in installation of HVAC duct insulation of similar type to that specified for a minimum of 5 years.
          2. Use persons trained for installation of HVAC duct insulation.
       3. Inspection & Verification:
          1. The use of certified mechanical insulation inspectors who maintain current certification by the National Insulation Association, or other certified mechanical insulation certification association, is recommended throughout the project to inspect and verify the materials are and the total insulation system has been installed in accordance with the specifications.
    2. DELIVERY, STORAGE, AND HANDLING
       1. Delivery Requirements: Deliver materials to site in manufacturer’s original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.
       2. Storage and Handling Requirements:
          1. Store and handle materials in accordance with manufacturer’s instructions.
          2. Keep materials in manufacturer’s original, unopened containers and packaging until installation.
          3. Store materials in clean, dry area indoors.
          4. Do not store materials directly on floor or ground.
          5. Store materials out of direct sunlight.
          6. Keep materials from freezing.
          7. Protect materials during storage, handling, and installation to prevent damage.
    3. AMBIENT CONDITIONS
       1. Do not install HVAC duct insulation under ambient conditions outside manufacturer’s limits.
  1. PRODUCTS
     1. MANUFACTURERS
        1. Manufacturer: Aeroflex USA, Inc., 232 Industrial Park Road, Sweetwater, Tennessee 37874. 866-237-6235. [www.aeroflexusa.com](http://www.aeroflexusa.com).

Specifier Notes: Specify if substitutions will be permitted.

* + - 1. Substitutions: [Not permitted] [Comply with Division 01].
      2. Single Source: Provide materials from single manufacturer.
    1. HVAC DUCT INSULATION

Specifier Notes: Specify HVAC duct insulation required for the Project. Delete HVAC duct insulation not required.

* + - 1. Elastomeric Duct Insulation: “AEROFLEX Breathe-EZ Duct Insulation”.
         1. Description: Listed & Labeled, EPDM-rubber-based, fiber-free, microbial-resistant, acoustic, flexible, closed-cell, lightweight, elastomeric duct wrap.

Specifier Notes: Thicknesses through 2 inches pass ASTM E 84, UL 723, CAN/ULC-S102 25/50. Thicknesses greater than 2 inches do not pass ASTM E 84, UL 723, CAN/ULC-S102 25/50.

* + - * 1. Thicknesses: ½ inch, ¾ inch, 1 inch, 1-1/2 inches, 2 inches.
        2. Joint Closure: Apply “AEROFLEX Protape” over seams sealed with “AEROFLEX Aeroseal”, “AEROFLEX REF 1520”, or “AEROFLEX Aeroseal LVOC Black” adhesives.
        3. Approval/Conformance:

ASTM C 534 Type II, Grade 1.

ASTM C 1534, Type I.

ASTM G 21, fungal resistance test.

CDPH v1.2-2017, VOC emissions

International Mechanical Code, listed & labeled within plenums.

NFPA 90A.

NFPA 90B.

UL 181, Section 13 mold growth/humidity.

UL 181, Section 18 air erosion.

NY City MEA 171-04-M.

Energy code requirements of IECC and ASHRAE for R-8 duct insulation at 2-inch wall thickness.

* + - * 1. Thermal Conductivity, ASTM C 177 and C 518:

Mean Temperature 75 Degrees F (24 Degrees C): 0.255 BTU-in/hr-ft2-degree F.

* + - * 1. Service Temperature, Continuous, ASTM C 411:

Upper: 257 degrees F (125 degrees C).

Lower: Minus 70 degrees F (Minus 57 degrees C).

* + - * 1. Fire Safety Characteristics, Through 2-Inch Thickness:

UL 94: Class V-0.

Flame Spread Index, ASTM E 84, UL 723, CAN/ULC-S102: Less than 25.

Smoke Developed Index, ASTM E 84, UL 723, CAN/ULC-S102: Less than 50.

ASTM D 635: Self-extinguishing.

* + - * 1. Water Vapor Permeability, Maximum, ASTM E 96: 0.08 perm-inch.
        2. Water Absorption, Maximum, ASTM C 209: 0.2 percent by volume.
        3. Dimensional Stability, Maximum, ASTM C 356: 7 percent.
        4. Odor Emission, ASTM C 1304: Pass.
        5. Corrosiveness, ASTM C 665 and C 692, DIN 1988: Pass.
        6. Fungi/Mold Resistance, ASTM C 1338 and G 21, UL 181: No growth.
        7. VOC Emissions, CDPH v1.2-2017: less than or equal to 0.5 mg/m3.
        8. Erosion Resistance, ASTM C 1071, UL 181: Pass.
        9. Noise Reduction Coefficient, ASTM C 423:

1/2-Inch Thickness: 0.30

1-Inch Thickness: 0.46.

1-1/2-Inch Thickness: 0.54.

2-Inch Thickness: 0.56.

* + - * 1. UV Resistance, ASTM G 7: Minimal cracking.
        2. Ozone Resistance, ASTM D 1171: No cracking.
        3. Nitrosamine Content, US FDA CPG 7117.11, BS EN 12868: None detected.
        4. R-Value:

1/2-Inch Thickness: 2.2.

3/4-Inch Thickness: 3.3.

1-Inch Thickness: 4.2.

1-1/2-Inch Thickness: 6.4.

2-Inch Thickness: 8.4.

* + - 1. Elastomeric Duct Insulation with Pressure-Sensitive Adhesive (PSA): “AEROFLEX Breathe-EZ Duct Insulation PSA”.
         1. Description: Listed & Labeled, EPDM-rubber-based, fiber-free, microbial-resistant, acoustic, flexible, closed-cell, lightweight, elastomeric duct wrap with PSA.

Specifier Notes: Thicknesses through 2 inches pass ASTM E 84, UL 723, CAN/ULC-S102 25/50. Thicknesses greater than 2 inches do not pass ASTM E 84, UL 723, CAN/ULC-S102 25/50.

* + - * 1. Thicknesses: ½ inch, ¾ inch, 1 inch, 1-1/2 inches, 2 inches.
        2. Joint Closure: Apply “AEROFLEX Protape” over seams sealed with “AEROFLEX Aeroseal”, “AEROFLEX REF 1520”, or “AEROFLEX Aeroseal LVOC Black” adhesives.
        3. Approval/Conformance:

ASTM C 534, Type II, Grade 1.

ASTM C 1534, Type I

ASTM G 21, fungal resistance.

CDPH v1.2-2017, VOC emissions.

International Mechanical Code, listed & labeled within plenums.

NFPA 90A.

NFPA 90B.

UL 181, Section 12 mold growth/humidity.

UL 181, Section 17 air erosion.

NY City MEA 171-04-M.

Energy code requirements of IECC and ASHRAE for R-8 duct insulation at 2-inch wall thickness.

* + - * 1. Thermal Conductivity, ASTM C 177 and C 518:

Mean Temperature 75 Degrees F (24 Degrees C): 0.255 BTU-in/hr-ft2-degree F.

* + - * 1. Service Temperature, Continuous, Self-Adhering Insulation, ASTM C 411:

Upper: 240 degrees F (115 degrees C).

Lower: Minus 22 degrees F (Minus 30 degrees C).

* + - * 1. Fire Safety Characteristics, Through 2-Inch Thickness:

UL 94: Class V-0.

Flame Spread Index, ASTM E 84, UL 723, CAN/ULC-S102: Maximum 25.

Smoke Developed Index, ASTM E 84, UL 723, CAN/ULC-S102: Maximum 50.

ASTM D 635: Self-extinguishing.

* + - * 1. Water Absorption, Maximum, ASTM C 209: 0.2 percent by volume.
        2. Water Vapor Permeability, Maximum, ASTM E 96: 0.08 perm-inch.
        3. Dimensional Stability, Maximum, ASTM C 356: 7 percent.
        4. Odor Emission, ASTM C 1304: Pass.
        5. Corrosiveness, ASTM C 665 and C 692, DIN 1988: Pass.
        6. Fungi/Mold Resistance, ASTM C 1338 and G 21, UL 181: No growth.
        7. VOC Emissions, CDPH v1.2-2017: less than or equal to 0.5 mg/m3.
        8. Erosion Resistance, ASTM C 1071, UL 181: Pass.
        9. Noise Reduction Coefficient, ASTM C 423:

½-Inch Thickness: 0.30.

1-Inch Thickness: 0.46.

1-1/2-Inch Thickness: 0.54.

2-Inch Thickness: 0.56.

* + - * 1. UV Resistance, ASTM G 7: Minimal cracking.
        2. Ozone Resistance, ASTM D 1171: No cracking.
        3. Nitrosamine Content, US FDA CPG 7117.11, BS EN 12868: None detected.
        4. R-Value:

½-Inch Thickness: 2.2.

¾-Inch Thickness: 3.3.

1-Inch Thickness: 4.2.

1-1/2-Inch Thickness: 6.4.

2-Inch Thickness: 8.4.

* + - * 1. Pressure-Sensitive Adhesive (PSA):

Adhesive: Scrim-reinforced, acrylic, pressure-sensitive adhesive.

Adhesive Thickness, PSTC-133: 3.0 mils.

Peel Adhesion, PSTC-101: 116 oz/inch.

Shear Strength, PSTC-107: Greater than 6 hours.

Service Temperature, Minimum: Minus 22 degrees F (Minus 30 degrees C).

Service Temperature, Maximum, Continuous: 240 degrees F (115 degrees C).

* + - 1. Elastomeric Duct Insulation: “AEROFLEX-EP Sheet & Roll [FM Approved]”.
         1. Description: Flexible, closed-cell, lightweight, EPDM-rubber-based, elastomeric sheet and roll insulation, FM Approved.
         2. Thicknesses: 1/2 inch, 1 inch, 1-1/2 inches, 2 inches.
         3. Joint Closure: Apply “AEROFLEX Aeroseal Black Adhesive”.
         4. Approval/Conformance:

ASTM C 534, Type II, Grade 1.

ASTM C 1534, Type I.

FM Approvals Standard 4924, FM Approval ID PR465702.

Energy code requirements of IECC and ASHRAE for R-4 refrigeration piping at 1-inch wall thickness.

* + - * 1. Thermal Conductivity, ASTM C 177 and C 518:

Mean Temperature 75 Degrees F (24 Degrees C): 0.257 BTU-in/hr-ft2-degree F.

* + - * 1. Service Temperature, Continuous, ASTM C 411:

Upper: 257 degrees F (125 degrees C).

Lower: Minus 70 degrees F (Minus 57 degrees C).

* + - * 1. Water Vapor Permeability, Maximum, ASTM E 96: 0.10 perm-inch.
        2. Water Absorption, Maximum, ASTM C 209: 0.2 percent by volume.
        3. Fire Safety Characteristics, Through 2-Inch Thickness:

FM Approvals Standard 4924.

* + - * 1. Flexibility, ASTM C 534: Pass.
        2. R-Value for Sheet Insulation:

1/2-Inch Thickness: 2.1.

1-Inch Thickness: 4.0.

1-1/2-Inch Thickness: 6.1.

2-Inch Thickness: 8.0.

* + - 1. Elastomeric Sheet and Roll Insulation with Pressure-Sensitive Adhesive (PSA): “AEROFLEX -EP Sheet & Roll PSA [FM Approved]”.
         1. Description: Flexible, closed-cell, lightweight, EPDM elastomeric sheet and roll insulation with PSA, FM Approved.
         2. Thicknesses: 1/2 inch, 1 inch, 1-1/2 inches, 2 inches.
         3. Joint Closure: Apply “AEROFLEX Aeroseal Black Adhesive”.
         4. Approval/Conformance:

ASTM C 534, Type II, Grade 1.

ASTM C 1534, Type I.

FM Approvals Standard 4924, FM Approval ID PR465702.

Energy code requirements of IECC and ASHRAE for R-4 refrigeration piping at 1-inch wall thickness.

* + - * 1. Thermal Conductivity, ASTM C 177 and C 518:

Mean Temperature 75 Degrees F (24 Degrees C): 0.257 BTU-in/hr-ft2-degree F.

* + - * 1. Service Temperature, Continuous, ASTM C 411:

Upper: 240 degrees F (115 degrees C).

Lower: Minus 22 degrees F (Minus 30 degrees C).

* + - * 1. Water Vapor Permeability, Maximum, ASTM E 96: 0.10 perm-inch.
        2. Water Absorption, Maximum, ASTM C 209: 0.2 percent by volume.
        3. Fire Safety Characteristics, Through 2-Inch Thickness:

FM Approvals Standard 4924.

* + - * 1. Flexibility, ASTM C 534: Pass.
        2. R-Value for Sheet Insulation:

1/2-Inch Thickness: 2.1.

1-Inch Thickness: 4.0.

1-1/2-Inch Thickness: 6.1.

2-Inch Thickness: 8.0.

* + - * 1. Pressure-Sensitive Adhesive (PSA):

Adhesive: Acrylic, pressure-sensitive adhesive.

Adhesive Thickness, PSTC-133: 3.0 mils.

Peel Adhesion, PSTC-101: 116 oz/inch.

Shear Strength, PSTC-107: Greater than 6 hours.

Application Temperature, Minimum: Minus 22 degrees F (Minus 30 degrees C).

Service Temperature, Maximum, Continuous: 240 degrees F (115 degrees C).

* + 1. ACCESSORIES

Specifier Notes: Specify HVAC duct insulation accessories required for the Project. Delete accessories not required.

* + - 1. Rubber Tape: “AEROFLEX Protape”.
         1. Description: Self-adhering, zero-perm, EPDM-based, rubber tape for covering glued seams of AEROFLEX EPDM elastomeric duct insulation.
         2. Material: EPDM rubber.
         3. Color: Black and White/Gray.
         4. Thickness: 24 mils, plus or minus 4 mils (0.024 inch, plus or minus 0.004 inch).
         5. Width: 1 inch, 2 inches, 3 inches, 4 inches, 5 inches.
         6. Adhesive: Pressure-sensitive acrylic.
         7. Adhesion Peel Strength, Minimum, ASTM D 3330, Peeling Speed 20 mm (3/4 inch)/min: 1.20 kg/25 mm.
         8. Tensile Strength, Minimum, JIS K 6301, Pulling Speed 50 mm (2 inches)/min: 2.5 N/mm2.
         9. Elongation, Minimum, JIS K 6301, Pulling Speed 50 mm (2 inches)/min: 50 percent.
         10. Holding Power, ASTM D 3654, Applied Load 1 kg: 3 hours.
         11. Initial Tack, ASTM D 3121, #15: 5/16 inch.
         12. Service Temperature, ASTM C 411:

Upper: 257 degrees F (125 degrees C).

Lower: Minus 70 degrees F (Minus 57 degrees C).

* + - * 1. UV Resistance, ASTM G 7: Pass.
        2. Ozone Resistance, ASTM D 1171: No cracking.
        3. Water Vapor Permeability, ASTM E 96: 0.00 perm-inch.
        4. Water Absorption, ASTM C 209: 0.2 percent by weight.
        5. Fire Safety Characteristics:

UL 94: Class V-0.

Flame Spread Index, ASTM E 84, UL 723: Less than 25.

Smoke Developed Index, ASTM E 84, UL 723: Less than 50.

ASTM D 635: Self-extinguishing.

* + - * 1. VOC Emissions, CDPH v1.2-2017: less than or equal to 0.5 mg/m3.
        2. Corrosion of Copper and Stainless Steel, ASTM C 692, DIN 1988: Non-corrosive, pass.
        3. Nitrosamine Content, US FDA CPG 7117.11, BS EN 12868: None detected.
      1. Contact Adhesive: “AEROFLEX Aeroseal”.
         1. Description: Modified-neoprene contact adhesive for bonding AEROFLEX EPDM elastomeric duct insulation.
         2. Composition: Synthetic-rubber base with synthetic resins and fillers added.
         3. VOC Content: 417 g/L.
         4. Tack Time: 1 to 3 minutes, under ideal conditions.
         5. Weight: 6.9 lbs. per gallon.
         6. Solids Content: Approximately 25 percent by weight.
         7. Service Temperature: Minus 20 degrees F to 257 degrees F (Minus 28 degrees C to 125 degrees C) for tubes, Minus 20 degrees F to 200 degrees F (Minus 20 degrees C to 93 degrees C) for sheets & rolls.
         8. Fire Safety Characteristics, ASTM E 84, UL 723:

Flame Spread Index: Less than 25.

Smoke Developed Index: Less than 50.

* + - * 1. Coverage: Up to 200 ft2 per gallon.
        2. Shelf Life: 1 year (store at room temperature, avoid freezing).
      1. Contact Adhesive: “AEROFLEX REF 1520”.
         1. Description: Modified-neoprene contact adhesive for bonding AEROFLEX EPDM elastomeric duct insulation. Listed and labeled.
         2. Composition: Synthetic-rubber base with synthetic resins and fillers added.
         3. VOC Content: 615 g/L.
         4. Tack Time: 1 to 3 minutes, under ideal conditions.
         5. Weight: 6.9 lbs. per gallon.
         6. Solids Content: Approximately 25 percent by weight.
         7. Service Temperature: Minus 20 degrees F to 257 degrees F (Minus 28 degrees C to 125 degrees C) for tubes, Minus 20 degrees F to 200 degrees F (Minus 28 degrees C to 93 degrees C) for sheets & rolls.
         8. Fire Safety Characteristics, ASTM E 84, UL 723:

Flame Spread Index: Less than 25.

Smoke Developed Index: Less than 50.

* + - * 1. Coverage: Up to 200 ft2 per gallon.
        2. Shelf Life: 1 year (store at room temperature, avoid freezing).
      1. Contact Adhesive: “AEROFLEX Aeroseal LVOC Black”.
         1. Description: Low-VOC content and emissions, synthetic-rubber-base contact adhesive for bonding AEROFLEX EPDM elastomeric duct insulation.
         2. Composition: Synthetic-rubber base with synthetic resins and fillers added.
         3. VOC Content: 50 g/L or less.
         4. VOC Emissions: 0.5 mg/m3 or less.
         5. LBC Red List Chemicals: Zero.
         6. Tack Time: 3 to 5 minutes, under ideal conditions.
         7. Weight: 7.0 lbs. per gallon.
         8. Solids Content: Approximately 26 percent by weight.
         9. Service Temperature: Minus 20 degrees F to 257 degrees F (Minus 28 degrees C to 125 degrees C) for tubes, Minus 20 degrees F to 200 degrees F (Minus 28 degrees C to 93 degrees C) for sheets & rolls.
         10. Fire Safety Characteristics, ASTM E 84, UL 723:

Flame Spread Index: Less than 25.

Smoke Developed Index: Less than 50.

* + - * 1. Coverage: Up to 200 ft2 per gallon.
        2. Shelf Life: 1 year (store at room temperature, avoid freezing).
      1. Acrylic Emulsion Coating: “AEROFLEX Aerocoat”.
         1. Description: Premium acrylic-emulsion, water-based, latex coating for application as a UV-protective or decorative coating for AEROFLEX EPDM elastomeric duct insulation.

Specifier Notes: Diluting or adding color tint is not recommended, as it will negatively affect product performance.

* + - * 1. Color: [White].
        2. VOC Content: 116 g/L.
        3. VOC Emissions: 0.5 mg/m3 or less.
        4. Dry Time: up to 4 hours between coats.
        5. Weight: Approximately 10 lbs. per gallon.
        6. Solids Content: Approximately 50 percent by weight.
        7. Elongation: Over 400 percent.
        8. Coverage: Up to 400 ft2 per gallon.
        9. Reapply: Approximately every 3-5 years.
        10. Shelf Life: 1 year (store at room temperature, avoid freezing).
      1. Low-VOC Coating: “AEROFLEX Aerocoat LVOC”.
         1. Description: Low-VOC content and emissions, water-based, latex coating for application as a UV-protective or decorative coating for AEROFLEX EPDM elastomeric duct insulation.

Specifier Notes: Diluting or adding color tint is not recommended, as it will negatively affect product performance.

* + - * 1. Color: [White].
        2. VOC Content: 50 g/L or less.
        3. VOC Emissions: 0.5 mg/m3 or less.
        4. LBC Red List Chemicals: Zero.
        5. Dry Time: up to 4 hours between coats.
        6. Weight: Approximately 11 lbs. per gallon.
        7. Solids Content: Approximately 55 percent by weight.
        8. Coverage: Up to 300 ft2 per gallon.
        9. Reapply: Approximately every 3-5 years.
        10. Shelf Life: 1 year (store at room temperature, avoid freezing)
  1. EXECUTION
     1. EXAMINATION
        1. Examine HVAC ducts to receive insulation.
        2. Verify HVAC ducts have been inspected, tested, and approved.
        3. Do not begin surface preparation or installation to HVAC ducts with leaks.
        4. Notify Architect of conditions that would adversely affect installation or subsequent use.
        5. Do not begin surface preparation or installation until unacceptable conditions are corrected.
     2. SURFACE PREPARATION
        1. Prepare HVAC duct surfaces in accordance with manufacturer’s instructions.
        2. Remove moisture, condensation, dirt, dust, debris, oil, grease, coatings, and other surface contaminants which could adversely affect installation of HVAC duct insulation.
     3. INSTALLATION
        1. Install HVAC duct insulation in accordance with manufacturer’s instructions.
        2. Install HVAC duct insulation to HVAC ducts specified in Division 23 sections and as indicated on the Drawings.
        3. Install HVAC duct insulation at thicknesses specified for each item of HVAC ducts.
        4. Install HVAC duct insulation to clean dry surfaces.
        5. Install HVAC duct insulation with least number of joints practical.
        6. Seal insulation butt joints and seams in accordance with manufacturer’s instructions.
     4. ADJUSTING
        1. Repair minor damages to HVAC duct insulation in accordance with manufacturer’s instructions and as approved by Architect.
        2. Remove and replace with new material, damaged HVAC duct insulation that cannot be successfully repaired, as determined by Architect.
     5. CLEANING
        1. Clean HVAC duct insulation promptly after installation in accordance with manufacturer’s instructions.
        2. Do not use harsh cleaning materials or methods that could damage insulation.
     6. PROTECTION
        1. Protect Work of this Section from damage until Substantial Completion.

Specifier Notes: Delete the Schedules article if not required for the Project or if the HVAC Duct Insulation Schedule is on the Drawings.

Coordinate the HVAC Duct Insulation Schedule with the products specified in Part 2 – Products of this Section.

* + 1. SCHEDULES
       1. HVAC Duct Insulation Schedule:

END OF SECTION