

**233116 - FIBROUS GLASS DUCT INSULATION**  
**230700 - HVAC DUCT INSULATION**

**PART 1 – GENERAL**

**1.01 SUMMARY**

- A. Section Includes: The work covered by this specification consists of furnishing all labor, equipment, materials and accessories, and performing all operations required for the correct fabrication and installation of commercial and residential air distribution ductwork of fibrous glass duct, in accordance with applicable project drawings and specifications, subject to the terms and conditions of the contract.
- B. Related Sections: Section 15880 – Air Distribution
- C. Measurement Procedures: Dimensions shown on the plans are inside dimensions.

**1.02 REFERENCES**

- A. ASHRAE 90.1- 2013 – Energy Efficient Design of New Buildings
- B. ASTM C 423 – Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method
- C. ASTM C 1136 – Specification for Flexible, Low Permeance Vapor Retarders for Thermal Insulation
- D. ASTM E 84 – Test Method for Surface Burning Characteristics of Building Materials
- E. ASTM G 21 – Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi
- F. NAIMA AH116 – Fibrous Glass Duct Construction Standards
- G. NAIMA AH122 – Cleaning Fibrous Glass Insulated Air Duct Systems
- H. NFPA 90A – Standard for the Installation of Air-Conditioning and Ventilating Systems
- I. NFPA 90B – Standards for the Installation of Warm Air Heating and Air Conditioning Systems
- J. NFPA 255 – Method of Test of Surface Burning Characteristics of Building Materials
- K. UL 181 – Safety Standard for Factory-Made Air Ducts and Air Connectors
- L. UL 181A – Closure Systems for Use with Rigid Air Ducts and Air Connectors
- M. UL 723 – Test for Surface Burning Characteristics of Building Materials

**1.03 SUBMITTALS**

- A. Product Data: Provide product description, list of materials and thickness and manufacturer's installation instructions for each duct to be fabricated or installed.
- B. Shop Drawings: Submit list of products to be used and include installation details for all ducts to be fabricated or installed.
- C. Samples: Submit samples of duct board to be used.

**1.04 QUALITY ASSURANCE**

- A. Duct board shall be manufactured at facilities certified and registered with an approved registrar to conform to the ISO 9001: 2015 Quality Standard.
- B. All work shall conform to accepted industry and trade standards for commercial and industrial insulations, and shall conform to manufacturer's recommendations.
- C. Duct board that has become wet or contaminated shall not be installed.
- D. Verify that insulation of the proper thickness and R value, meeting ASHRAE 90.1 and/or local requirements is to be installed.

**1.05 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver all materials (duct board, tapes, cements, adhesives, coatings, etc.) to the job site in factory containers with manufacturer's label showing manufacturer, product name and product fire hazard information.
- B. Protect the insulation from dirt, water, chemical attack and mechanical damage before, during and after installation.
- C. Maintain job site temperature and conditions, before, during and after installation, as required by the manufacturers of adhesives and coatings.

**PART 2 – PRODUCTS**

**2.01. MANUFACTURERS**

- A. Duct board: Johns Manville

**2.02. MATERIALS**

- A. Micro-Aire fibrous glass duct, [type 475, 1"] [type 800, 1", 1-1/2", 2"] meeting the following requirements:
  1. Compliance with UL 181.
  2. Minimum thermal resistance (R-value) at 75°F (24°C)

1"	4.3 hr-F-ft <sup>2</sup> /BTU	0.76m <sup>2</sup> -C/W
1-1/2"	6.5 hr-F-ft <sup>2</sup> /BTU	1.15 m <sup>2</sup> -C/W
2"	8.7 hr-F-ft <sup>2</sup> /BTU	1.53 m <sup>2</sup> -C/W

- 3. Minimum NRC per ASTM C423 using a type "A" mounting

1" type 475	0.70
1-1/2" type 800	0.85
2" type 800	0.95

- 4. Rated for use with air at temperatures up to 250°F (121°C).
- 5. Rated maximum velocity of 5000 fpm (25.4 m/sec) when tested in accordance with UL 181.
- 6. Fiber shed shall not be detectable as determined by scanning electron analysis of isokinetic sampling at maximum rated velocity.
- 7. Flame spread no greater than 25 and smoke developed

no greater than 50 when tested in accordance with ASTM E 84, UL 723 or NFPA 255 as a composite.

8. Classified as meeting the requirements of limited combustibility per NFPA 90A.
9. Shall not contain asbestos, lead, mercury, or mercury compounds.

#### B. Closures

1. Heat seal tape meeting the requirements of UL 181A-H.
2. Pressure sensitive tapes meeting the requirements of UL 181A-P.
3. Glass fabric and mastic meeting the requirements of UL 181A-M.

#### C. Accessories

4. SuperSeal® and SuperSeal® HV for coating exposed edges, connections or minor surface damage not requiring replacement insulation.
5. Tie rods, 12 gauge (2.7 mm) galvanized steel wire
6. Washers, 2-½" x 2-½" x 0.028" (64 mm x 64 mm x 0.71 mm) galvanized steel
7. Trapeze hangers, minimum 1" x 2" x 1" (25 mm x 51 mm x 25 mm) galvanized 22 gauge (0.85 mm) channel
8. Support strap, 1" (25 mm) x 22 gauge (0.85 mm) (or heavier) galvanized
9. Hanging rods, minimum ¼" (6.4 mm) diameter
10. Anti-sag support, minimum ½" (13 mm) diameter galvanized steel electrical conduit (EMT)

### **PART 3 – EXECUTION**

#### 3.01 EXAMINATION

- A. Verify that it is physically possible to install Micro-Aire duct board in accordance with project drawings, operation performance parameters and manufacturer's recommendations.

#### 3.02 RESTRICTIONS

- A. Micro-Aire should not be used:
  2. For vertical risers serving more than two floors.
  3. In duct systems operating above 250°F (121°C).
  4. For kitchen or corrosive fume exhaust ducts.
  5. To convey solids or corrosive gases.
  6. To build casings or housings.
  7. Closer than 2" (51 mm) to electric heating coils.
  8. In equipment rooms where severe mechanical abuse can occur.
  9. In low clearance garages.
  10. Outdoors.
  11. Within 6 feet (1.8 m) of fresh air intakes or outside grilles.
  12. For bathroom exhaust exposed to subfreezing temperatures.
  13. In systems without automatic temperature controls.

14. In coal or wood-fired systems where fire dampers are required.

#### 3.03 FABRICATION OF STRAIGHT DUCT AND FITTINGS

- A. All male/female joints shall be properly overlapped so that there are no interruptions or gaps. Joint alignment offset shall not exceed ¼" (6.4 mm). Joints shall be secured with UL 181A compliant tape applied circumferentially around the duct, over the seam.
- B. Reinforcing shall be installed on duct systems with internal static pressures up to 2" w.c. (0.50 kPa) in accordance with NAIMA Fibrous Glass Duct Construction Standards and manufacturer recommendations.
- C. Anti-sag supports shall be placed in positive pressure ducts 48" (1220 mm) or larger.
- D. Where male/female joints and/or staples are not used, 8" (200 mm) strips of closure material will be placed on 12" (300 mm) centers, minimum one per side as an assembly and prior to sealing the seam with tape.
- E. JM SuperSeal HV or SuperSeal will be used to coat all exposed edges and minor surface abrasions to airstream surface.
- F. JM SuperSeal HV will be used to fill minor gaps and indentations in airstream surface.
- G. FSK facing tears shall be repaired with UL 181A tape.
- H. Connections to metal shall be secured with mechanical fasteners, minimum one per side on 12" (300 mm) centers, and UL 181A compliant closure. If airstream pressure is above 1" w.c. (0.25 kPa) the closure should be with glass fabric and mastic, UL 181A-M.
- I. Moveable duct internals shall be installed with clearance to fiber glass surface, or a metal rubbing plate or sleeve shall be installed.

#### 3.04 INSTALLATION

- A. All work activities shall be conducted in accordance with all applicable federal, state and local codes and laws. This shall include, but not be limited to, the Occupational Safety and Health Act.

#### 3.05 FIELD QUALITY CONTROL

- A. Upon completion of installation of the Micro-Aire duct board and before HVAC system start-up, visually inspect the ductwork and verify that the duct board has been correctly installed.
- B. Confirm that any damage to the air stream surface has been repaired and that the duct is free of obstructions and debris.
- C. Confirm that any damage to the vapor retarder exterior surface has been properly repaired.
  1. After the system is completely installed and ready for service, conduct an inspection of the entire system. This inspection should include, as a minimum, the following steps:

2. Check all registers, grilles, and diffusers to ensure they are clean and free from construction debris.
  3. Check all filters in accordance with manufacturer's instructions. Use specified grade of filters at all times system is operating.
  4. Cover supply openings with filter media prior to system start-up to catch any loose material that may remain inside the ductwork.
  5. Turn on the HVAC system and allow it to run until steady state operation is reached.
  6. Remove the temporary filter media from supply openings and along with it any loose material trapped by the media.
  7. Check to ensure that air delivery performance meets all requirements.
- 3.06 CLEANING
- A. Cleaning of fibrous duct, required, shall be done in accordance with NAIMA recommended practice contained in publication AHJ22 "Cleaning Fibrous Glass Insulated Air Duct Systems".

## END OF SECTION



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