

SECTION 15820
DUCT ACCESSORIES

PART 1 - GENERAL

1.01 PROVISIONS INCLUDED

- A. The general provisions of the Contract, including General and Supplementary Conditions, and Division 1 General Requirements, apply to work specified in this Section.
- B. Requirements of Section 15050, "Basic Mechanical Materials and Methods" apply to work specified in this Section.

1.02 SUMMARY

- A. This Section includes the following:
 - 1. Manual volume dampers.
 - 2. Fire dampers.
 - 3. Duct silencers.
 - 4. Turning vanes.
 - 5. Duct-mounted access doors and panels.
 - 6. Flexible connectors.
 - 7. Accessories.

1.03 SUBMITTALS

- A. Product data including details for materials, dimensions of individual components, profiles, and finishes for the following items:
 - 1. Manual volume control dampers.
 - 2. Fire dampers.
 - 3. Duct-mounted access panels and doors.
 - 4. Duct silencers.
 - 5. Turning vanes
 - 6. Flexible connectors
- B. Shop drawings from manufacturer detailing assemblies. Include dimensions, weights, loadings, required clearances, method of field assembly, components, and location and size of each field connection. Detail the following:
 - 1. Special fittings and volume control damper installation details.
 - 2. Fire damper installations, including sleeves and duct-mounted access door and panel installations.
- C. Duct Silencer Product Certification: Submit certified test data on dynamic insertion loss; self-noise power levels; and airflow performance data, static pressure loss, and dimensions and weights.

1.04 QUALITY ASSURANCE

- A. NFPA Compliance: Comply with the following NFPA Standards:
 - 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."
- B. Comply with 1995 SMACNA "HVAC Duct Construction Standards, Metal and Flexible," 2nd Edition.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

Subject to compliance with requirements, provide products of one of the following:

- A. Volume Dampers:
 - 1. Buckley Air Products, Inc.
 - 2. Ruskin Mfg. Co.
 - 3. United McGill Corporation
- B. Fire Dampers:
 - 1. Air Balance, Inc.
 - 2. Prefco Products, Inc.
 - 3. Ruskin Mfg. Co.
- C. Duct Silencers:
 - 1. Industrial Acoustics Company
 - 2. Vibro-Acoustics
- D. Turning Vanes:
 - 1. Ductmate Industries, Inc.
 - 2. Schuller International, Inc.
 - 3. Tuttle & Bailey
- E. Flexible Connectors:
 - 1. Duro Dyne Corporation
 - 2. Ventfabrics, Inc.

2.02 MANUAL VOLUME DAMPERS

- A. General: Factory-fabricated with required hardware and accessories. Stiffen damper blades for stability.
 - 1. Provide locking device to hold single-blade dampers in a fixed position without vibration. Close duct penetrations for damper components to seal duct consistent with pressure class.

2. Pressure Classifications of 3-inch w.g. or Higher: End bearings or other seals for ducts. Axles full length of damper blades and provide bearings at both ends of operating shaft.
- B. Standard Volume Dampers: Multiple- or single-blade, parallel- or opposed-blade design as indicated, standard leakage rating, with linkage outside of air stream, and suitable for horizontal or vertical applications.
1. Steel Frames: Hat-shaped, galvanized-steel channels, minimum of 16 gage, and with mitered and welded corners; frames with flanges where indicated for attaching to walls; flangeless frames where indicated for installation in ducts.
 2. Roll-Formed Steel Blades: 16-gage galvanized steel.
 3. Blade Axles: Galvanized steel.
 4. Tie Bars and Brackets: Galvanized steel.
- C. Low-Leakage Volume Dampers: Multiple- or single-blade, parallel- or opposed-blade design as indicated, low-leakage rating, with linkage outside of air stream, and suitable for horizontal or vertical applications.
1. Steel Frames: Hat-shaped, galvanized, sheet-steel channels, minimum of 16 gage, and with mitered and welded corners; frames with flanges where indicated for attaching to walls; flangeless frames where indicated for installation in ducts.
 2. Roll-Formed Steel Blades: 16-gage galvanized, sheet steel.
 3. Blade Seals: Vinyl.
 3. Blade Seals: Neoprene.
 4. Blade Axles: Galvanized steel.
 5. Tie Bars and Brackets: Galvanized steel.
- D. Jackshaft: 1-inch-diameter, galvanized-steel pipe rotating within a pipe-bearing assembly mounted on supports at each mullion and at each end of multiple damper assemblies. Provide appropriate length and number of mountings to connect linkage of each damper of a multiple damper assembly.
- E. Damper Hardware: Zinc-plated, die-cast core with dial and handle made of 3/32-inch-thick zinc-plated steel, and a 3/4-inch hexagon locking nut. Provide center hole to suit damper operating rod size. Provide elevated platform for insulated duct mounting.

2.03 FIRE DAMPERS

- A. General: Dynamic fire dampers, UL labeled to UL Standard 555 "Standard for Fire Dampers."
- B. Fire Rating: 1-1/2 hours for use in one and two hour walls; 3 hours, for use in 3 hour walls.
- C. Frame: Type B with blades out of airstream; fabricated with roll-formed, 24-gage, galvanized-steel; with mitered and interlocking corners.
- D. Mounting Sleeve: Factory or field-installed galvanized, sheet steel.
 1. Minimum Thickness: 0.056-inch (16-gage) or 0.138-inch (10-gage) thick as indicated, and length to suit application.

2. Exceptions: Omit sleeve where damper frame width permits direct attachment of perimeter mounting angles on each side of the wall or floor, and thickness of damper frame meets sleeve requirements.

- E. Mounting Orientation: Vertical or horizontal as indicated.
- F. Blades: Roll-formed, interlocking, 21-gage galvanized, sheet steel. In place of interlocking blades, provide full-length, 21-gage, galvanized-steel blade connectors.
- G. Horizontal Dampers: Include a blade lock and stainless steel negator closure spring.
- H. Fusible Link: Replaceable, 165 deg F .

2.04 DUCT SILENCERS

- A. General: Factory-fabricated and -tested, round or rectangular silencer with performance characteristics and physical requirements as indicated.
- B. Fire Performance: Adhesives, sealers, packing material, and accessory materials shall have fire ratings not exceeding 25 for flame spread and 50 for smoke developed when tested according to ASTM E 84, "Standard Test Method for Surface Burning Characteristics of Building Materials."
- C. Rectangular Units: Fabricate casings with a minimum of 22-gage solid sheet metal for outer casing and 26-gage perforated sheet metal for inner casing.
- D. Sheet Metal Perforations: 1/8-inch diameter for inner casing and baffle sheet metal.
- E. Fibrous Acoustic Fill Material: Inert and vermin-proof fibrous material, packed under not less than 5 percent compression to eliminate voids due to vibration and settling.
- F. Fabricate silencers to form rigid units that will not pulsate, vibrate, rattle, or otherwise react to system pressure variations.
 1. Do not use nuts, bolts, and sheet metal screws for unit assemblies.
 2. Lock form and seal or continuously weld joints.
 3. Suspended Units: Factory-installed suspension hooks or lugs attached to the frame in quantities and spaced to prevent deflection or distortion.
 4. Reinforcement: Cross angles or trapeze angles for rigid suspension.
- G. Source Quality Control: Perform the following factory tests:
 1. Acoustic Performance: Test silencers with airflow in both directions through silencer, according to ASTM E 477, "Methods of Testing Duct Liner Materials and Prefabricated Silencers for Acoustical and Airflow Performance."
 2. Record acoustic ratings, including dynamic insertion loss and self-noise power levels for both forward flow (air and noise in same direction) and reverse flow (air and noise in opposite directions) with an airflow of at least 2,000 FPM face velocity.
 3. Leak Test: Test units for airtightness at 200 percent of associated fan static pressure or 6-inch w.g. static pressure, whichever is greater.

2.05 TURNING VANES

- A. Fabricate turning vanes according to SMACNA HVAC Duct Construction Standards, Figures 2-3 through 2-5.
- B. Acoustic Turning Vanes: Fabricate of airfoil-shaped aluminum extrusions with perforated faces and fiber glass fill.

2.06 DUCT-MOUNTED ACCESS DOORS AND PANELS

- A. General: Fabricate doors and panels airtight and suitable for duct pressure class.
- B. Frame: Galvanized, sheet steel, with bend-over tabs and foam gaskets.
- C. Door in insulated duct systems: Double-wall, galvanized sheet metal construction with insulation fill and thickness, number of hinges and locks as indicated in SMACNA "HVAC Duct Construction Standards - Metal and Flexible," 1995 Edition, (two locks minimum) for duct pressure class. Provide vision panel where indicated. Provide 1-inch by 1-inch butt hinge or piano hinge and cam latches. Minimum 12" X 12".
- D. Seal around frame attachment to duct and door to frame with neoprene or foam rubber.
- E. Insulation: 1-inch thick fiber glass or polystyrene foam board.

2.07 FLEXIBLE CONNECTORS

- A. General: Flame-retarded or noncombustible fabrics, coatings, and adhesives complying with UL 181, Class 1.
- B. Standard Metal-Edged Connectors: Factory-fabricated with a strip of fabric 3-1/2 inches wide attached to two strips of 2-3/4-inch-wide, 24-gage, galvanized sheet steel or 22-gage aluminum sheets. Select metal compatible with connected ducts.
- C. Conventional, Outdoor System Flexible Connectors Fabric: Glass fabric double coated with a synthetic-rubber weatherproof coating resistant to the sun's ultraviolet rays and ozone environment.
 - 1. Minimum Weight: 26 oz. per sq yd.
 - 2. Tensile Strength: 530 lb per inch in the warp and 440 lb per inch in the filling.

2.08 ACCESSORIES

- A. Instrument Test Holes: Cast iron or cast aluminum to suit duct material, including screw cap and gasket. Size to allow insertion of pitot tube and other testing instruments, length to suit duct insulation thickness.
- B. Flexible Duct Clamps: Stainless steel band with cadmium-plated hex screw to tighten band with a worm-gear action, sizes 3 to 18 inches to suit duct size.

- C. Adhesives: High strength, quick setting, neoprene based, waterproof and resistant to gasoline and grease.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine areas and conditions for compliance with requirements for installation tolerances and other conditions affecting performance of duct accessories. Do not proceed with installation until unsatisfactory conditions are corrected.

3.02 INSTALLATION

- A. Install duct accessories according to manufacturer's installation instructions and applicable details shown in SMACNA 1995 "Hvac Duct Construction Standards – Metal and Flexible," 2nd Edition, for metal ducts.
- B. Install volume control dampers in lined duct with methods to avoid damage to and erosion of duct liner.
- C. Provide test holes at fan inlet and outlet and elsewhere as indicated.
- D. Install fire dampers according to the manufacturer's UL-approved printed instructions; Install fusible links in fire dampers.
- E. Install duct access panels for panels for access to both sides of duct mounted coils. Install duct access panels downstream of volume dampers, fire dampers, turning vanes, and equipment.
 - 1. Install duct access panels to allow access to interior of ducts for cleaning, inspecting, adjusting, and maintaining accessories and terminal units.
 - 2. Install access panels on side of duct where adequate clearance is available.
- F. Label access doors in ductwork according to Section 15075,"Mechanical Identification."

3.03 ADJUSTING

- A. Adjust duct accessories for proper settings.
- B. Adjust fire dampers for proper action.
- C. Final positioning of manual dampers is specified in Section 15950 "Testing, Adjusting, and Balancing."

END OF SECTION 15820