

**SECTION 23 33 00  
DUCTWORK ACCESSORIES**

**GENERAL**

**1.1 SECTION INCLUDES**

- A. Air turning devices.
- B. Duct access doors.
- C. Duct test holes.
- D. Flexible duct connections.
- E. Fire dampers.
- F. Volume control dampers.
- G. Gravity backdraft dampers.
- H. Remote damper operators
- I. Control dampers

**1.2 REFERENCE SECTION 23 05 00 FOR THE FOLLOWING:**

- A. References.
- B. Submittals.
- C. Project record documents.
  - 1 Record actual locations of access doors, test holes etc.
- D. Qualifications.
  - 1 Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum five years documented experience.
- E. Regulatory requirements.
  - 1 Products Requiring Electrical Connection: UL Listed and classified.
- F. Delivery, storage, and handling.
  - 1 See Section 23 05 00.
- G. Extra materials.

- 1 Provide two of each size and type of fusible link for fire and combination fire/smoke dampers.

### 1.3 PRODUCTS

### 1.4 AIR TURNING DEVICES

- A. Note that air extractors or "scoops" shall not be used under any circumstances.
- B. Fabricated turning vanes: Provide turning vanes and vane runners constructed in accordance with SMACNA "HVAC Construction Standards", current edition.
- C. Manufactured turning vanes: Provide turning vanes constructed of 1-1/2" wide curved blades set at 3/4" o.c., supported with bars set at 2" o.c., and set into side strips suitable for mounting in ductwork.

### 1.5 DUCT ACCESS DOORS

- A. Fabrication: Rigid and close-fitting of galvanized steel with sealing gaskets and quick fastening locking devices. For insulated ductwork, install minimum one inch thick insulation with sheet metal cover.
  - 1 Less Than 12 Inches Square: Secure with sash locks.
  - 2 Up to 18 Inches Square: Provide two hinges and two sash locks.
  - 3 Up to 24 x 48 Inches: Three hinges and two compression latches with outside and inside handles.
  - 4 Larger Sizes: Provide an additional hinge.
- B. Access doors with sheet metal screw fasteners are not acceptable.

### 1.6 DUCT TEST HOLES

- A. Temporary Test Holes: Cut or drill in ducts as required. Cap with neat patches, neoprene plugs, threaded plugs, or threaded or twist-on metal caps.
- B. Permanent Test Holes: Factory fabricated, air tight flanged fittings with screw cap, Ventlok or approved equivalent. Provide extended neck fittings to clear insulation.

### 1.7 FLEXIBLE DUCT CONNECTIONS

- A. Fabricate in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible.
- B. Construct flexible connector of neoprene coated flameproof fabric crimped into duct flanges for attachment to duct and equipment.

### 1.8 FIRE DAMPERS

- 1.9 Fabricate in accordance with NFPA 90A and UL 555, and as indicated.

- A. Ceiling Dampers: Galvanized steel, 22 gage frame and 16 gage flap, two layers 0.125 inch ceramic fiber on top side, and one layer on bottom side for round flaps, with locking clip.
- B. Curtain Type Dampers: Galvanized steel with interlocking blades. Provide stainless steel closure springs and latches. Configure with blades out of air stream.
- C. Fusible Links: UL 33, separate at 160 degrees F with adjustable link straps for combination fire/balancing dampers.

#### 1.10 VOLUME CONTROL DAMPERS

- A. Fabricated in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible, and as indicated.
  - 1 Blade: Fabricate of double thickness sheet metal to streamline shape, secured with continuous hinge or rod.
  - 2 Operator: Minimum 3/8 inch square shaft with nylon end bearings at each end to reduce air leakage.
- B. Single Blade Dampers: Fabricate for duct sizes up to 6 x 30 inch.
- C. Multi-Blade Damper: Fabricate of opposed blade pattern with maximum blade sizes 8 x 72 inch. Assemble center and edge crimped blades in prime coated or galvanized channel frame with suitable hardware.
- D. End Bearings: Except in round ductwork 6 inches and smaller, provide nylon end bearings on each end. On multiple blade dampers, provide oil-impregnated nylon or sintered bronze bearings.
- E. Quadrants:
  - 1 Provide locking, indicating quadrant regulators on single and multi-blade dampers. Regulator shall be equivalent to Sheet Metal Connectors Model RP-3, with heavy-gauge steel regulator, wing nut locking assembly, and stamped dial indicating damper position.
  - 2 On externally insulated ducts, mount quadrant regulators on stand-off mounting brackets, bases, or adapters to avoid damaging or compression of insulation.
  - 3 Where rod lengths exceed 30 inches, provide regulator at both ends.

#### 1.11 TAKEOFFS

- A. Manufactured high-efficiency takeoff with 45-degree slope on the body, with gauge thickness equal to adjacent ductwork.

#### 1.12 GRAVITY BACKDRAFT DAMPERS

- A. Gravity Backdraft Dampers, Size 18 x 18 inches or Smaller, Furnished with Air Moving Equipment: Air moving equipment manufacturer's standard construction.
- B. Multi-Blade, Parallel Action Gravity Balanced Backdraft Dampers: 16 gage thick extruded aluminum, with blades of maximum 6 inch width, with felt or flexible vinyl sealed edges, linked together in rattle-free manner with 90 degree stop, steel ball bearings, and plated steel pivot pin; adjustment device to permit setting for varying differential static pressure.

#### 1.13 EXECUTION

#### 1.14 PREPARATION

- A. Verify that electric power is available and of the correct characteristics.

#### 1.15 INSTALLATION

- A. Install accessories in accordance with manufacturer's instructions, NFPA 90A, and follow SMACNA HVAC Duct Construction Standards - Metal and Flexible. Refer to Section 23 31 13 for duct construction and pressure class.
- B. Install duct accessories of materials suited to duct materials; use galvanized-steel accessories in galvanized-steel and fibrous-glass ducts and stainless-steel accessories in stainless-steel ducts.
- C. Install duct access doors on sides of ducts to allow for inspecting, adjusting, and maintaining accessories and equipment at the following locations:
  - 1 On both sides of duct coils.
  - 2 Upstream from duct filters.
  - 3 At outdoor-air intakes and mixed-air plenums.
  - 4 At drain pans and seals.
  - 5 Downstream from manual volume dampers, control dampers, backdraft dampers, and equipment.
  - 6 Adjacent to and close enough to fire or smoke dampers, to reset or reinstall fusible links. Access doors for access to fire or smoke dampers having fusible links shall be pressure relief access doors and shall be outward operation for access doors installed upstream from dampers and inward operation for access doors installed downstream from dampers.
  - 7 Upstream or downstream from duct silencers.
  - 8 Control devices requiring inspection.
  - 9 Elsewhere as indicated.
- D. Unless duct access door size is explicitly indicated, provide minimum 24 x 18-inch size duct access doors wherever possible. Provide 18 x 18, 12 x 12 inch or 8 x 8-inch size elsewhere, using the largest size possible.
- E. Install access doors with swing against duct static pressure.

- F. Provide duct test holes where indicated and required for testing and balancing purposes. Coordinate all test hole locations with UNLBSM commissioning representatives. Install with minimum 24" clear dimension from any side wall or other obstruction.
- G. Provide fire dampers, combination fire and smoke dampers and smoke dampers at locations indicated and where required by authorities having jurisdiction. Install with required perimeter mounting angles, sleeves, breakaway duct connections, corrosion resistant springs, bearings, bushings and hinges.
- H. Coordinate installation of all fire dampers, combination fire and smoke dampers, and smoke dampers with all other disciplines to ensure a minimum of 24"x24" clear horizontal access area from the ceiling vertically to the damper. The clear access area will be used for the inspection of damper fusible links and damper operators, as well as for the resetting of damper. Clear access areas and appropriate wall/ceiling access panels, if required, shall be clearly shown on the coordination drawings.
- I. Provide turning vanes on all 90 Deg mitered elbows and splitter vanes on all radius elbows unless the elbow has a center line radius of 1.5 times the width of the duct (SMACNA type RE1 elbow).
- J. Do not install any volume control, fire or combination fire/smoke dampers in fume exhaust ducts.
- K. Install smoke dampers and combination smoke and fire dampers in accordance with NFPA 92A.
- L. All fire and combination fire/smoke dampers shall be commissioned (tested) in the presence of Owner representative following installation and before the corresponding fan systems are turned on. Contractor shall open all access doors for the inspection and close all doors in the presence of the inspector.
- M. Demonstrate re-setting of fire dampers to Owner's representative.
- N. Provide flexible connections immediately adjacent to equipment in ducts associated with fans and motorized equipment, and supported by vibration isolators. Install flexible connectors with adequate flexibility to allow for all thermal, axial, transverse and torsional movement. Provide airtight seal. For fans developing static pressures of 5.0 inches and over, cover connections with leaded vinyl sheet, held in place with metal straps.
- O. Provide balancing dampers at points on supply, return, and exhaust systems where indicated on plans.
- P. Set dampers to fully open position before testing, adjusting, and balancing.
- Q. Provide a high-efficiency takeoff with 45-degree entry for each branch connection.

- R. Provide balancing dampers on duct take-off to diffusers, grilles, and registers, unless dampers are specified as part of the diffuser, grille, or register assembly. Dampers shall be fitted with quadrant control and standoff to extend through insulation. Omit manual balancing damper at single diffuser served by a single air terminal box.
- S. The use of splitter dampers is not acceptable.
- T. Install remote damper actuators where the volume damper is not accessible. Field paint the remote actuator cap to match the adjacent ceiling finish.

#### 1.16 FIELD QUALITY CONTROL

##### A. Tests and Inspections:

- 1 Operate dampers to verify full range of movement.
- 2 Inspect locations of access doors and verify that purpose of access door can be performed.
- 3 Operate and test fire, smoke, and combination fire and smoke dampers to verify full range of movement and verify that proper heat-response device is installed. All such tests shall be accomplished in the presence of a representative of BSM commissioning team.
- 4 Inspect turning vanes for proper and secure installation.
- 5 Operate remote damper operators to verify full range of movement of operator and damper.

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