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SECTION 23 30 00

AIR DUCT ACCESSORIES

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**PART 1 - GENERAL**

1.1 SUMMARY

- A. Section Includes:
  - 1. Manual-Volume Dampers
  - 2. Fire Dampers
  - 3. Turning Vanes
  - 4. Duct-Mounted Access Doors
  - 5. Flexible Connectors
  - 6. Flexible Ducts
  - 7. Accessories

1.2 REFERENCES

- A. [North American Insulation Manufacturers Association \(NAIMA\)](#) Publications:
  - 1. AH124 "Fibrous Glass Duct Liner Standard."
- B. [National Fire Protection Association \(NFPA\)](#) Publications:
  - 1. 90A "Standard for the Installation of Air Conditioning and Ventilating Systems"
  - 2. 90B "Standard for the Installation of Warm Air Heating and Air-Conditioning Systems"
- C. [Sheet Metal and Air Conditioning Contractors' National Association \(SMACNA\)](#) Publications:
  - 1. "Fire Damper and Heat Stop Guide for Air Handling Systems"
  - 2. "HVAC Duct Construction Standards—Metal and Flexible"
- D. [Underwriter's Laboratories, Inc. \(UL\)](#) Standards:
  - 1. 181 "Standard for Factory-Made Air Ducts and Air Connectors"
  - 2. 181B "Closure Systems for Use With Flexible Air Ducts and Air Connectors"
  - 3. 555 "Fire Dampers"
  - 4. 555C "Standard for Safety for Ceiling Dampers"
  - 5. Product Certificates: Submit certified test data on dynamic insertion loss; self-noise power levels; and airflow performance data, static-pressure loss, dimensions, and weights.

1.3 QUALITY ASSURANCE

- A. [NFPA](#) Compliance: Comply with the following [NFPA](#) standards:
  - 1. [NFPA](#) 90A, "Installation of Air Conditioning and Ventilating Systems."
  - 2. [NFPA](#) 90B, "Installation of Warm Air Heating and Air Conditioning Systems."

- B. Sheet Metal and Air Conditioning Contractors National Association, Inc. manuals ([SMACNA](#)) except where details or notes on drawings indicate otherwise.
  - 1. HVAC Duct Construction Standards—Metal and Flexible.
  - 2. Fire Damper and Heat Stop Guide for Air Handling Systems.

## **PART 2 - PRODUCTS**

### **2.1 MANUFACTURERS**

- A. Approved Manufacturers:
  - 1. Manual Volume Dampers.
    - a. [Ruskin Company](#) (816-761-7476)
    - b. [Air Balance, Division of Mestek](#) (419-865-5000)
    - c. [Prefco](#) (Perfect Air Control, Inc.) (800-437-6653)
  - 2. Fire Dampers.
    - a. [Ruskin Company](#) (816-761-7476)
    - b. [Air Balance, Division of Mestek](#) (419-865-5000)
    - c. [Prefco](#) (Perfect Air Control, Inc.) (800-437-6653)
  - 3. Ceiling Fire Dampers.
    - a. [Ruskin Company](#) (816-761-7476)
    - b. [Air Balance, Division of Mestek](#) (419-865-5000)
    - c. [Prefco](#) (Perfect Air Control, Inc.) (800-437-6653)
  - 4. Flexible Connectors.
    - a. [Ventfabrics, Inc.](#) (800-621-1207)
    - b. [Ward Industries, Inc.](#) (630-595-7320)
    - c. [Vent Products Co.](#) (800-368-8368)
  - 5. Flexible Ducts
    - a. [Clevaflex. Ltd.](#) (216-941-6505)

### **2.2 MANUAL VOLUME DAMPERS**

- A. General: Factory fabricated with required hardware and accessories. Stiffen damper blades for stability. Include 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.
- B. Standard Volume Dampers: Multiple- or single-blade, parallel- or opposed-blade design as indicated, standard leakage rating, with linkage outside airstream, and suitable for horizontal or vertical applications.
  - 1. Steel Frames: Hat-shaped, galvanized, sheet steel channels, minimum of 0.064 inch thick, with mitered and welded corners; frames with flanges where indicated for attaching to walls; and flangeless frames where indicated for installing in ducts.
  - 2. Roll-Formed Steel Blades: 0.064-inch- thick, galvanized, sheet steel.
  - 3. Blade Axles: Nonferrous.
  - 4. Tie Bars and Brackets: Galvanized steel.

- C. 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. Include center hole to suit damper operating-rod size. Include elevated platform for insulated duct mounting

## 2.3 FIRE DAMPERS

- A. General: Labeled to [UL](#) 555.
- B. Fire Rating: One and one-half hour unless noted otherwise.
- C. Frame: [SMACNA](#) Type B with blades out of airstream; fabricated with roll-formed, 0.034-inch-thick galvanized steel; with mitered and interlocking corners.
- D. Mounting Sleeve: Factory- or field-installed galvanized, sheet steel.
  - 1. Minimum Thickness: 0.052 inch or 0.138 inch thick and length to suit application.
  - 2. Exceptions: Omit sleeve where damper frame width permits direct attachment of perimeter mounting angles on each side of wall or floor, and thickness of damper frame complies with sleeve requirements.
- E. Mounting Orientation: Vertical or horizontal as indicated.
- F. Blades: Roll-formed, interlocking, 0.034 inch thick, galvanized, sheet steel. In place of interlocking blades, use full-length, 0.034 inch thick, galvanized steel blade connectors.
- G. Horizontal Dampers: Include a blade lock and stainless-steel negator closure spring.
- H. Fusible Link: Replaceable, 165 F rated or as indicated.
- I. Provide access door in duct adjacent to each fire damper.

## 2.4 CEILING FIRE DAMPERS

- A. General: Labeled to [UL](#) 555C; comply with construction details for tested floor- and roof-ceiling assemblies as indicated in [UL](#)'s "Fire Resistance Directory."
- B. Frame: 0.040 inch thick, galvanized, sheet steel; round or rectangular; style to suit ceiling construction.
- C. Blades: 0.034 inch thick, galvanized, sheet steel with nonasbestos refractory insulation.
- D. Fusible Link: Replaceable, 165 deg F rated.

## 2.5 TURNING VANES

- A. Fabricate to comply with [SMACNA](#)'s "HVAC Duct Construction Standards—Metal and Flexible."
- B. Manufactured Turning Vanes: Fabricate of 1-1/2 inch wide, curved blades set 3/4 inch o.c.; support with bars perpendicular to blades set 2 inches o.c.; and set into side strips suitable for mounting in ducts.

## 2.6 DUCT-MOUNTED ACCESS DOORS

- A. General: Fabricate doors airtight and suitable for duct pressure class.
- B. Frame: Galvanized, sheet steel, with bend-over tabs and foam gaskets.
- C. Door: Double-wall, galvanized, sheet metal construction with insulation fill and thickness, and number of hinges and locks as indicated for duct pressure class. Include vision panel where indicated. Include 1-by-1-inch butt or piano hinge and cam latches.
- D. Seal around frame attachment to duct and door to frame with neoprene or foam rubber.
- E. Insulation: 1-inch thick, fibrous-glass.

## 2.7 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, 0.028 inch thick, galvanized, sheet steel. Select metal compatible with connected ducts.
- C. Transverse Metal-Edged Connectors: Factory fabricated with a strip of fabric 3-1/2 inches wide attached to two strips of 4-3/8 inch wide, 0.028 inch thick, galvanized, sheet steel. Select metal compatible with connected ducts.
- D. Conventional, Indoor System Flexible Connector Fabric: Glass fabric double coated with polychloroprene.
  - 1. Minimum Weight: 26 oz./sq. yd.
  - 2. Tensile Strength: 480 lbf/inch in the warp, and 360 lbf/inch in the filling.
  - 3. Minimum Movement: 2 inches.
- E. Conventional, Outdoor System Flexible Connector 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./sq. yd.
  - 2. Tensile Strength: 530 lbf/inch in the warp, and 440 lbf/inch in the filling.
  - 3. Minimum Movement: 2 inches.

## 2.8 FLEXIBLE DUCTS

- A. General: Comply with [UL](#) 181, Class 1.
- B. Flexible Ducts, Uninsulated: Corrugated aluminum. For use on dryer vents only.
- C. Flexible Ducts, Insulated: Factory-fabricated, insulated, round duct, with an outer jacket enclosing 1-1/2-inch thick, glass-fiber insulation around a continuous inner liner.
  - 1. Reinforcement: Steel-wire helix encapsulated in inner liner.

2. Outer Jacket: Glass-reinforced, silver Mylar with a continuous hanging tab, integral fibrous-glass tape, and nylon hanging cord.
3. Inner Liner: Polyethylene film. Pressure Rating: 6-inch wg positive, 1/2-inch wg negative.

## 2.9 ACCESSORIES

### A. Louvers:

1. Provide blank off panels for unused portions of louvers. Panels shall be double wall construction with 0.032 inch aluminum, and 2 inch thick, internal glass fiber insulation in accordance with [SMACNA](#) "HVAC Duct Construction Standards—Metal and Flexible."

### B. Open ducts in suspended ceiling: No. 16 USSG, ¾ inch square mesh, screen over each opening; with 1 inch wide galvanized steel enclosing frame and flanged duct opening to receive frame. In lieu of screen and volume damper, provide register or grille plus opposed blade volume damper.

### C. Duct sleeves: Minimum 20 gauge USSG galvanized sheet steel unless otherwise indicated.

#### 1. Clearances:

- a. Non-insulated duct: 1 inch between duct and sleeve on all sides.
- b. Insulated duct: 1 inch between insulation and sleeve on all sides.
- c. Grilles, registers and diffusers: Zero clearance.

2. Provide closure collars for exposed ducts on each side of wall or floor opening. Collars shall be galvanized sheet metal, minimum 4 inch wide, and fit tight against surface and around duct or insulation. Install with nails 6 inch on center.

3. Framed openings: Provide clearances and closure collars the same as for duct sleeves.

4. Duct-mounted automatic control devices: Mount on mechanical equipment all devices related to automatic controls such as automatic dampers.

### D. Cleanout Doors Laundry Dryer Exhaust: Horizontal ducts shall be mounted maximum 20 ft. apart and in change of direction. Cleanout doors on horizontal duct shall be mounted on side of duct. Bottom edge shall be not less than 2 inches above bottom of duct. Cleanout doors at vertical ducts shall be mounted at base. Door and frame shall be same gauge as duct. Hinges shall be Ventlock No. 260, extra heavy zinc plated. Latches shall be Ventlock No. 140, cast zinc. Gaskets shall be between door and frame. Gaskets shall be 1/8 inch double thickness rated 2,000 deg F for kitchen exhaust system. Cleanout door size shall be maximum 24 inch x 24 inch and minimum shall be 24 inch one side, and other side shall be 2 inch less than duct height.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Install duct accessories according to applicable details shown in [SMACNA](#)'s "HVAC Duct Construction Standards—Metal and Flexible" for metal ducts and [NAIMA](#)'s "Fibrous Glass Duct Construction Standards" for fibrous-glass ducts.
- B. Install volume dampers in lined duct; 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 manufacturer's [UL](#)-approved written instructions.
  - 1. Install fusible links in fire dampers.
- E. Install duct access panels for access to both sides of duct coils. Install duct access panels downstream from volume dampers, fire dampers, turning vanes, automatic dampers, smoke detectors, outside and exhaust air plenums equipment, and other locations as indicated.
  - 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 according to Section 23 05 53 "Identification for HVAC Piping and Equipment."
- G. Provide flexible connections at fan and building joints.
- H. Install automatic dampers supplied by the automatic temperature control system manufacturer. Notch end of rod and label duct/casing to indicate open and closed blade position.
- I. Provide volume dampers at following locations:
  - 1. In all duct splits and branch connections of supply, return, and exhaust systems.
  - 2. Ducts connecting to common plenums.
  - 3. Ducts serving single outlet.
  - 4. At open return duct in hung ceiling.
  - 5. Other locations as indicated on drawings.
- J. Provide access doors in following locations and as indicated on the Drawings.
  - 1. Automatic dampers: linkage side.
  - 2. Main balancing dampers.
  - 3. Fire dampers.
  - 4. Smoke detection heads.
  - 5. On both sides of ducts where necessary to provide maintenance accessibility to equipment on the other side.
  - 6. Outside air and exhaust air plenums.

K. Flexible Duct Installation:

1. Installation shall be in accordance with [SMACNA](#) and local building code standards.
2. Flexible duct runs shall be a maximum of 5 feet, straight lengths, no bends.
3. Connections to beaded sheet metal fittings shall be with 3 wraps of approved tape and stainless steel draw band for tight seal. Seal the outer jacket with 3 wraps of approved [UL](#) 181B tape.
4. A 1 ½" minimum strap shall be used to support the flexible duct at a distance not greater than 5'-0". Maximum permissible sag is ½" per foot of duct length.

3.2 ADJUSTING

- A. Adjust duct accessories for proper settings.
- B. Adjust fire dampers for proper action.
- C. Final positioning of manual-volume dampers is specified in Section 23 00 00, Part 1, "Testing and Balancing".

**END OF SECTION**