

**SECTION 23 33 46 - FLEXIBLE DUCTS****PART 1 - GENERAL****1.01 SUMMARY**

- A. Section Includes:
  - 1. Insulated supply flexible ducts.

**1.02 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
- B. Sustainable Design Submittals:
  - 1. Product data showing compliance with ASHRAE 62.1.
  - 2. Product Data: For adhesives and sealants, indicating VOC content.
  - 3. Laboratory Test Reports: For adhesives and sealants, indicating compliance with requirements for low-emitting materials.
  - 4. Laboratory Test Reports: For Insulation, indicating compliance with requirements for low-emitting materials.
  - 5. Product Data: For insulation, indicating that R-values comply with tables in ASHRAE/IES 90.1, Section 6 - "Heating, Ventilating, and Air Conditioning."
- C. Shop Drawings: For flexible ducts.
  - 1. Include plans showing locations and mounting and attachment details.

**1.03 INFORMATIONAL SUBMITTALS**

- A. Coordination Drawings: Reflected ceiling plans, drawn to scale, and coordinated with each other, using input from installers of the items involved.

**PART 2 - PRODUCTS****2.01 ASSEMBLY DESCRIPTION**

- A. Comply with NFPA 90A, "Installation of Air Conditioning and Ventilating Systems," and with NFPA 90B, "Installation of Warm Air Heating and Air Conditioning Systems."
- B. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for acceptable materials, material thicknesses, and duct construction methods unless otherwise indicated. Sheet metal materials shall be free of pitting, seam marks, roller marks, stains, discolorations, and other imperfections.
- C. Comply with the Air Diffusion Council's "ADC Flexible Air Duct Test Code FD 72-R1."
- D. Comply with ASTM E 96/E 96M, "Test Methods for Water Vapor Transmission of Materials."

**2.02 INSULATED FLEXIBLE DUCTS**

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Atco

2. Flexmaster U.S.A., Inc.
  3. Flex-Tek Group.
  4. McGill AirFlow LLC.
  5. Thermaflex.
  6. Ward Industries; a brand of Hart & Cooley, Inc.
- B. Insulated, Flexible Duct: UL 181, Class 1, multiple layers of aluminum laminate supported by helically wound, spring-steel wire; fibrous-glass insulation; polyethylene [aluminized] vapor-barrier film.
1. Pressure Rating: 10-inch wg positive and 10-inch wg negative.
  2. Maximum Air Velocity: 4000 fpm.
  3. Temperature Range: Minus 20 to plus 210 deg. F.
  4. Insulation R-Value: Comply with ASHRAE/IES 90.1 - R4.2 in conditioned space, R8.0 in unconditioned space/outdoors.
  5. Comply with 25/50 flame spread and smoke density ratings.

## 2.03 FLEXIBLE DUCT CONNECTORS

- A. Clamps: Nylon strap in sizes 3 through 18 inches, to suit duct size.

## PART 3 - EXECUTION

### 3.01 INSTALLATION

- A. Install flexible ducts according to applicable details in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for metal ducts and in NAIMA AH116, "Fibrous Glass Duct Construction Standards," for fibrous-glass ducts.
- B. Applies to supply ductwork only. Exhaust and return ductwork to be rigid ductwork.
- C. Flexible air connectors and flexible ducts shall not be used to make 90 degree or greater.
- D. Install in indoor applications only. Flexible ductwork should not be exposed to UV lighting.
- E. Connect terminal units to supply ducts with maximum 12-inch lengths of flexible duct. Do not use flexible ducts to change directions.
- F. Connect diffusers or light troffer boots to ducts with maximum 10'-0" lengths of flexible duct clamped or strapped in place.
- G. Connect flexible ducts to metal ducts with liquid adhesive plus tape.
- H. Install duct test holes where required for testing and balancing purposes.
- I. Installation:
1. Install ducts fully extended.
  2. Do not bend ducts across sharp corners.
  3. Bends of flexible ducting shall not exceed a minimum of one duct diameter.
  4. Avoid contact with metal fixtures, water lines, pipes, or conduits.
  5. Install flexible ducts in a direct line, without sags, twists, or turns.
- J. Supporting Flexible Ducts:
1. Suspend flexible ducts with bands 1 ½ inches wide or wider and spaced a maximum of 48 inches apart. Maximum centerline sag between supports shall not exceed 1/2 inch per 12 inches.
  2. Install extra supports at bends placed approximately one duct diameter from center line of the bend.
  3. Ducts may rest on ceiling joists or truss supports. Spacing between supports shall not exceed the maximum spacing per manufacturer's written installation instructions.

4. Vertically installed ducts shall be stabilized by support straps at a maximum of 72 inches o.c.

END OF SECTION