

**SECTION 23 37 00  
AIR OUTLETS AND INLETS**

**PART 1 - GENERAL**

**1.1 DESCRIPTION**

A. Air Outlets and Inlets: Diffusers, Registers, and Grilles.

**1.2 RELATED WORK**

- A. Section 13 05 41, SEISMIC RESTRAINT REQUIREMENTS FOR NON-STRUCTURAL COMPONENTS.
- B. Section 23 05 11, COMMON WORK RESULTS FOR HVAC.
- C. Section 23 05 41, NOISE and VIBRATION CONTROL FOR HVAC PIPING and EQUIPMENT.
- D. Section 23 05 93, TESTING, ADJUSTING, and BALANCING FOR HVAC.

**1.3 QUALITY ASSURANCE**

- A. Refer to article, QUALITY ASSURANCE, in Section 23 05 11, COMMON WORK RESULTS FOR HVAC.
- B. Fire Safety Code: Comply with NFPA 90A.

**1.4 SUBMITTALS**

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, and SAMPLES.
- B. Manufacturer's Literature and Data: Diffusers, registers, grilles and accessories.
- C. Coordination Drawings: Refer to article, SUBMITTALS, in Section 23 05 11, COMMON WORK RESULTS FOR HVAC.

**1.5 APPLICABLE PUBLICATIONS**

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only.
- B. Air Diffusion Council Test Code:  
1062 GRD-84.....Certification, Rating, and Test Manual 4<sup>th</sup>  
Edition
- C. American Society of Civil Engineers (ASCE):  
ASCE7-05.....Minimum Design Loads for Buildings and Other  
Structures
- D. American Society for Testing and Materials (ASTM):  
A167-99(2009).....Standard Specification for Stainless and  
Heat-Resisting Chromium-Nickel Steel Plate,  
Sheet and Strip

B209-14.....Standard Specification for Aluminum and  
Aluminum-Alloy Sheet and Plate

E. National Fire Protection Association (NFPA):

90A-12.....Standard for the Installation of Air  
Conditioning and Ventilating Systems

F. Underwriters Laboratories, Inc. (UL):

181-14.....UL Standard for Safety Factory-Made Air Ducts  
and Connectors

## **PART 2 - PRODUCTS**

### **2.1 EQUIPMENT SUPPORTS**

Refer to Section 23 05 11, COMMON WORK RESULTS FOR HVAC.

### **2.2 AIR OUTLETS AND INLETS**

A. Materials:

1. Steel or aluminum. Use aluminum air outlets and inlets for sterilizer areas. Exhaust air registers located in toilet rooms with shower stalls shall be constructed from aluminum. Provide manufacturer's standard gasket.
2. Exposed Fastenings: The same material as the respective inlet or outlet. Fasteners for aluminum may be stainless steel.
3. Contractor shall review all ceiling drawings and details and provide all ceiling mounted devices with appropriate dimensions and trim for the specific locations.

B. Performance Test Data: In accordance with Air Diffusion Council Code 1062GRD. Refer to Section 23 05 41, NOISE and VIBRATION CONTROL FOR HVAC PIPING and EQUIPMENT for NC criteria.

C. Air Supply Outlets:

1. Ceiling Diffusers (Type D-1): Suitable for surface mounting, exposed T-bar or special tile ceilings, off-white finish, round neck connection. Provide plaster frame for units in drywall ceilings.
  - a. Square, fully adjustable pattern: Round neck, surface mounting unless shown otherwise on the drawings. Provide equalizing or control grid and volume control damper; straightening grid; ant-smudge ring; strap in core; and continuous gasket.
  - b. Louver face type: removable core for 1, 2, 3, or 4 way directional pattern. Horizontal air pattern held tight to ceiling.
2. High volume, low velocity perforated diffuser (Type D-2):

The diffuser shall be for full radial air diffusion (two-way) or one-half radial air diffusion (one-way). The face and back pan shall be constructed of aluminum. Suitable for surface mounting, exposed T-bar or special tile ceiling, off-white finish. Provide plaster frame for units in drywall ceiling.

- a. Diffusers shall be constructed using a maximum 4 inches tall back pan. The back pan shall be divided into two chambers connected via a baffle aperture designed to evenly distribute air across the diffuser's perforated face. The back pan shall have integral hanger tabs for securing the unit to the overhead structure.
- b. The baffles forming the aperture shall be located within the lower air chamber.
- c. The face of the diffuser shall be constructed of 13 percent free area perforated aluminum or 1/4-inch staggered centers.
- d. The interior of the diffuser shall be accessible for sanitization from below (room-side) by loosening quarter-turn fasteners to allow the face to swing open, and can be disengaged by releasing the retainer cables attaching the face to the diffuser frame.
- c. Finish: Off white baked enamel for ceiling mounted units. Wall units shall have a prime coat for field painting, or shall be extruded with manufacturer's standard finish.

#### D. Air Exhaust Inlets

1. Exhaust Registers (Type R-1): Provide vertical face with opposed blade damper without removable key operator for registers and continuous gasket.
  - a. Finish: Off-white baked enamel for ceiling mounted units. Wall units shall have a prime coat for field painting, or shall be extruded aluminum with manufacturer's standard aluminum finish.
  - b. Standard Type: Fixed horizontal face bars set at 30 to 45 degrees set 20 mm (3/4-inch) centers and approximately 30 mm (1-1/4 inch) flat margin.
2. Supply Registers (Type R-2): Double deflection type with horizontal face bars; opposed blade damper with removable key operator; and continuous gasket.
  - a. Margin: Flat, 30 mm (1-1/4 inches) wide.
  - b. Bar spacing: 20 mm (3/4 inch) maximum.
  - c. Finish: Off-white baked enamel.

3. Linear slot diffuser/plenum (Type R-3):

- a. Diffuser: Frame and support bars shall be constructed of heavy gauge extruded aluminum. Form slots or use adjustable pattern controllers, to provide stable, horizontal air flow pattern over a wide range of operating conditions.
- b. Provide integral galvanized steel boot plenum.
  - 1) Provide inlet connection to plenum.
  - 2) Maximum pressure drop at design flow rate: 25 Pa (0.15 inch W.G.)
  - 3) Provide inlet connection to boot plenum. Inlet duct and plenum size shall be as recommended by the manufacturer.

E. Exhaust and Transfer Grilles (Type G-1): Same as Type R-1 registers but without the opposed blade damper

**PART 3 - EXECUTION**

**3.1 INSTALLATION**

- A. Comply with provisions of Section 23 05 11, COMMON WORK RESULTS FOR HVAC, particularly regarding coordination with other trades and work in existing buildings.
- B. Protection and Cleaning: Protect equipment and materials against physical damage. Place equipment in first class operating condition, or return to source of supply for repair or replacement, as determined by Contracting Officer's Representative. Protect equipment during construction against entry of foreign matter to the inside and clean both inside and outside before operation and painting.

**3.3 TESTING, ADJUSTING AND BALANCING (TAB)**

Refer to Section 23 05 93, TESTING, ADJUSTING, and BALANCING FOR HVAC.

**3.4 OPERATING AND PERFORMANCE TESTS**

Refer to Section 23 05 11, COMMON WORK RESULTS FOR HVAC .

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