

SECTION 233700
AIR OUTLETS AND INLETS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Diffusers.
- B. Registers/grilles.
- C. Door grilles.
- D. Louvers.
- E. Roof hoods.

1.2 RELATED SECTIONS

- A. Division 07 - Metal wall louvers.
- B. Division 08 - Door grilles.
- C. Division 09 - Painting: Painting of ductwork visible behind outlets and inlets.

1.3 REFERENCES

- A. ADC 1062 - Certification, Rating and Test Manual.
- B. AMCA 500 - Test Method for Louvers, Dampers and Shutters.
- C. ARI 650 - Air Outlets and Inlets.
- D. ASHRAE 70 - Method of Testing for Rating the Air Flow Performance of Outlets and Inlets.
- E. SMACNA - HVAC Duct Construction Standard - Metal and Flexible.
- F. NFPA 70 - National Electrical Code.
- G. NFPA 90A - Installation of Air Conditioning and Ventilating Systems.

1.4 SUBMITTALS

- A. Submit under the provisions of Division 01.
- B. Product Data: Provide data for equipment required for this project. Review outlets and inlets as to size, finish, and type of mounting prior to submission. Submit schedule of outlets and inlets showing type, size, location, application, and noise level if greater than 30 NC.
- C. Samples: Submit one (1) of each required air outlet and inlet type.

1.5 SUBMITTALS AT PROJECT CLOSEOUT

- A. Submit under the provisions of Division 01.

- B. Record actual locations of air outlets and inlets.

1.6 QUALITY ASSURANCE

- A. Test and rate air outlet and inlet performance in accordance with ADC Equipment Test Code 1062 and ASHRAE 70.
- B. Test and rate louver performance in accordance with AMCA 500.

1.7 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing the Products specified in this section with a minimum of five (5) years' documented experience.

PART 2 PRODUCTS

2.1 ROUND CEILING DIFFUSERS

- A. Manufacturers:
 - 1. Titus Model TMRA.
 - 2. Other acceptable manufacturers offering equivalent products.
 - a) Price.
 - b) MetalAire.
 - c) Krueger.
 - d) Nailor.
- B. Type: Round, adjustable pattern, stamped or spun, multicore diffuser to discharge air in 360-degree pattern, with sectorizing baffles where indicated. The diffuser collar shall project not more than one inch above ceiling.
- C. Fabrication: Steel or Aluminum with baked enamel off-white finish.

2.2 RECTANGULAR CEILING DIFFUSERS

- A. Manufacturers:
 - 1. Price.
 - 2. Other acceptable manufacturers offering equivalent products.
 - a) Titus.
 - b) MetalAire.
 - c) Krueger.
 - d) Nailor.
- B. Type: Square, adjustable pattern, stamped, three- or four-core diffuser to discharge air in four-way pattern with sectorizing baffles where indicated.
- C. Frame: Surface mount or Inverted T-bar type. Reference architectural reflected ceiling schedule for type of frame. Reference mechanical floor plan for size of face and duct.
- D. Fabrication: Steel with baked enamel off-white finish.

2.3 SUPPLY REGISTERS/GRILLES

- A. Manufacturers:
 - 1. Titus Model 300RL.

2. Other acceptable manufacturers offering equivalent products.
 - a) Price.
 - b) MetalAire.
 - c) Krueger.
 - d) Nailor.
- B. Type: Streamlined and individually adjustable blades on 3/4-inch centers to discharge air along face of grille, two-way deflection.
- C. Frame: 1-1/4-inch margin with countersink screw mounting and gasket.
- D. Fabrication: Steel with factory off-white enamel finish.
- E. Damper: Integral, gang-operated, opposed blade type with removable key operator, operable from face.

2.4 EXHAUST AND RETURN REGISTERS/GRILLES

- A. Manufacturers:
 1. Price.
 2. Other acceptable manufacturers offering equivalent products.
 - a) Titus.
 - b) MetalAire.
 - c) Krueger.
 - d) Nailor.
- B. Type: Streamlined blades, 1-inch minimum depth, 3/4 inch maximum spacing, with blades set at 45 degrees.
- C. Frame: 1-1/4-inch margin with countersunk screw mounting.
- D. Fabrication: Steel with 20 gage minimum frames and 22 gage minimum blades, steel, and aluminum with 20 gage minimum frame, or aluminum extrusions, with factory off-white enamel finish.
- E. Damper: Integral, gang-operated, opposed blade type with removable key operator, operable from face where not individually connected to exhaust fans.

2.5 CEILING GRID CORE EXHAUST AND RETURN REGISTERS/GRILLES

- A. Manufacturers:
 1. Price.
 2. Other acceptable manufacturers offering equivalent products.
 - a) Titus.
 - b) MetalAire.
 - c) Krueger.
 - d) Nailor.
- B. Type: Fixed grilles of 1/2 x 1/2 x 1/2 inch louvers.
- C. Frame: 1-1/4-inch margin with channel lay-in frame for suspended grid ceilings.
- D. Fabrication: Aluminum with factory off-white enamel finish.

2.6 CEILING LINEAR SLOT SUPPLY AND RETURN GRILLES

- A. Manufacturers:
 - 1. Price.
 - 2. Other acceptable manufacturers offering equivalent products.
 - a) Titus.
 - b) MetalAire.
 - c) Krueger.
 - d) Nailor.
- B. Type: Continuous slot as specified on drawings, with adjustable vanes for left, right, or vertical discharge.
- C. Fabrication: Aluminum extrusions with factory off-white enamel finish and black pattern controllers.
- D. Frame: One inch margin with support clips and T bar mounting and gasket.
- E. Plenum: Integral, galvanized steel, insulated.

2.7 LINEAR BAR REGISTERS/GRILLES

- A. Manufacturers:
 - 1. Price.
 - 2. Other acceptable manufacturers offering equivalent products.
 - a) Titus.
 - b) MetalAire.
 - c) Krueger.
 - d) Nailor.
- B. Type: Streamlined blades with 15-degree deflection, 7/32 x 3/4 inch on 1/2 inch centers.
- C. Frame: One inch margin with countersunk screw mounting and gasket.
- D. Fabrication: Aluminum extrusions, with factory natural anodized finish.

2.8 ACCESSORIES

- A. Diffusers: Radial opposed blade damper, adjustable from diffuser face, only where a branch damper cannot be installed.
- B. Registers: Integral gang-operated opposed blade damper with removable key operator, operable from face, only where a branch damper cannot be installed.

2.9 DOOR GRILLES

- A. Manufacturers:
 - 1. Titus Model CT-700.
 - 2. Other acceptable manufacturers offering equivalent products.
 - a) Price.
 - b) MetalAire.
 - c) Krueger.
 - d) Nailor.
- B. Type: V-shaped louvers of aluminum one inch deep on 2/3-inch centers.

- C. Frame: Extruded aluminum with auxiliary frame to give finished appearance on both sides of door, with factory prime coat finish.

2.10 LOUVERS

- A. Manufacturers:
 - 1. Ruskin Model ELF6375DX.
 - 2. Other acceptable manufacturers offering equivalent products.
 - a) Dowco.
 - b) Louvers and Dampers (Air Balance).
 - c) Greenheck.
 - d) NCA Manufacturing.
- B. Type: Drainable 6 inch deep with blades on 37-degree slope with center baffle, heavy channel frame, birdscreen with ½ inch square mesh.
- C. Fabrication: 0.081-inch-thick minimum extruded aluminum, welded assembly, with factory Kynar finish to be selected.
- D. Mounting: Furnish with flat flange frame with screw holes in jambs or extended channel frame for sill installation. Coordinate with architectural details.

2.11 ROOF HOODS

- A. Manufacturers:
 - 1. ACME Model EV and IV.
 - 2. Other acceptable manufacturers offering equivalent products.
 - a) Penn.
 - b) Cook.
 - c) Greenheck.
- B. Fabricate air inlet or exhaust hoods in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible.
- C. Fabricate of galvanized steel, minimum 16-gage base and 20-gage hood, or aluminum, minimum 16-gage base, and 18-gage hood; suitably reinforced; with removable hood; birdscreen with ½-inch square mesh for exhaust and ¾-inch for intake, and factory prime coat finish.
- D. Fabricate louver penthouse with mitered corners and reinforce structural angles.
- E. Mount unit on minimum curb base as specified on the detail with insulation between duct and curb.
- F. Make hood outlet area minimum of twice throat area.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install in accordance with the manufacturer's instructions.
- B. Check location of outlets and inlets and make necessary adjustments in position to conform to architectural features, symmetry, and lighting arrangement.
- C. Install diffusers to ductwork with airtight connection.

- D. Provide balancing dampers on duct takeoff to diffusers, and grilles and registers, despite whether dampers are specified as part of the diffuser, or grille and register assembly.
- E. Paint ductwork visible behind air outlets and inlets matte black. Refer to Division 09.
- F. Air inlets and outlets located in U.L. rated floor or roof ceiling assemblies shall be a U.L. listed product in accordance with the assembly.

END OF SECTION