

SECTION 15850

AIR OUTLETS AND INLETS

PART 1 –GENERAL

1.1 SUMMARY

- A. Section includes diffusers, light troffer diffusers, registers/grilles, door grilles, louvers, louvered penthouses, roof hoods, goosenecks.
- B. Related Sections:
 - 1. Section 09050 - Paints and Coatings: Execution and product requirements for Painting of ductwork visible behind outlets and inlets specified by this section.

1.2 REFERENCES

- A. ADC 1062 (Air Diffusion Council) - Certification, Rating and Test Manual.
- B. AMCA 500 (Air Movement and Control Association) - Test Method for Louvers, Dampers and Shutters.
- C. ASHRAE 70 (American Society of Heating, Refrigerating and Air Conditioning Engineers) - Method of Testing for Rating the Airflow Performance of Outlets and Inlets.
- D. SMACNA (Sheet Metal and Air Conditioning Contractors' National Association) - HVAC Duct Construction Standard - Metal and Flexible.

1.3 SUBMITTALS

- A. Section 01330 - Submittal Procedures: Submittal procedures.
- B. Product Data: Submit data outlets and inlets sizes, finish, and type of mounting prior to submission. Submit schedule of outlets and inlets showing type, size, location, application, and noise level.
- C. Samples: Submit two of each required air outlet and inlet type.
- D. Test Reports: Rating of air outlet and inlet performance.
- E. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

1.4 CLOSEOUT SUBMITTALS

- A. Section 01770 – Execution Requirements: Closeout procedures.
- B. Project Record Documents: Record actual locations of air outlets and inlets and send a copy to Stanford Maps and Records.

1.5 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.

1.6 MOCK-UP

- A. Only required as directed by Designer or Project Manager.
- B. Section 01450 – Quality Requirements: Mock-up requirements.
- C. Provide typical exterior or interior ceiling module with supply and return air outlets.
- D. Locate where directed.
- E. Mock-up may be part of general ceiling mock-up specified in Section 01450.
- F. Mock-up may remain as part of the work.

1.7 PRE-INSTALLATION MEETING

- A. Section 01330 - Administrative Requirements: Pre-installation meeting.
- B. Convene minimum one week prior to commencing work of this section.

1.8 WARRANTY

- A. Section 01770 - Execution Requirements: Product warranties and product bonds.

PART 2 –PRODUCTS

2.1 MANUFACTURERS

- 1. Titus
- 2. Price
- 3. Anemostat
- 4. Barber Coleman
- 5. Tuttle & Bailey

6. or approved equal

2.2 ROUND CEILING DIFFUSERS

- A. Product Description: Type: Round, adjustable pattern, stamped or spun, multicore diffuser to discharge air in 360 degree pattern, with sector baffles where indicated.
- B. Diffuser collar not more than 1 inch above ceiling per design and application. In plaster ceilings, provide plaster ring and ceiling plaque.
- C. Fabrication: Steel with baked enamel finish color to be determined by design.
- D. Accessories: Radial opposed-blade, Butterfly or combination splitter damper and multi-louvered equalizing grid with damper adjustable from diffuser face per design.

2.3 RECTANGULAR CEILING DIFFUSERS

- A. Type: Square, adjustable pattern, stamped, multi-core Square and rectangular, adjustable pattern multi-louvered diffuser to discharge air in 360 degree one way, two-way, three-way or four-way pattern with sector baffles where indicated per design.
- B. Frame: Surface mount Snap-in Inverted T-bar Spline type per design and application. In plaster ceilings, provide plaster frame and ceiling frame.
- C. Fabrication: Steel with baked enamel finish color to be determined per design.
- D. Accessories: Radial opposed-blade Butterfly or Combination splitter damper and multi-louvered equalizing grid with damper adjustable from diffuser face.

2.4 PERFORATED FACE CEILING DIFFUSERS

- A. Manufactured by Titus unless approved otherwise.
- B. Type: Perforated face with fully adjustable pattern and removable face.
- C. Frame: Surface mount Snap-in Inverted T-bar Spline type per design and application. In plaster ceilings, provide plaster frame and ceiling frame.
- D. Fabrication: Steel with steel frame and baked enamel finish color to be determined per design.

- E. Accessories: Radial opposed-blade Butterfly or Combination splitter damper and multi-louvered equalizing grid with damper adjustable from diffuser face.

2.5 MODIFIED LIGHT TROFFER DIFFUSERS

- A. Type: Single or double plenum constructed independent of light troffer with volume and pattern controllers, air inlet either round or oval, top or side. Match diffusers to light troffer for airtight connection without tools.
- B. Fabrication: Galvanized steel with welded or soldered joints and finish matte black inside.

2.6 CEILING SLOT DIFFUSERS

- A. Type: Continuous wide slot, number of slots wide to be determined with adjustable vanes for left, right or vertical discharge; integral fire damper where design requires.
- B. Fabrication: Steel with factory clear lacquer, backed enamel finish, color to be selected.
- C. Frame: margin with countersunk screw concealed support clips for suspension system or support clips for T bar mounting and gasket mitered end border. Open end construction or end cap.
- D. Plenum: Integral, galvanized steel, insulated or non-insulated as design dictates.

2.7 CEILING SUPPLY REGISTERS/GRILLES

- A. Type: Streamlined and individually adjustable curved blades to discharge air along face of grille, one-way or two-way deflection.
- B. Frame: Margin with countersunk screw or concealed mounting and gasket.
- C. Fabrication: Aluminum extrusions with factory clear lacquer or prime coat finish as design dictates, color to be selected.
- D. Damper: Integral, gang-operated, opposed-blade type with removable key operator, operable from face.

2.8 CEILING EXHAUST AND RETURN REGISTERS/GRILLES

- A. Manufactured by Titus unless approved otherwise.

- B. Type: Streamlined blades, $\frac{3}{4}$ inch minimum depth, $\frac{3}{4}$ inch maximum spacing, with blades set at 45 degrees, vertical or horizontal face.
- C. Frame: Margin with countersunk screw concealed mounting.
- D. Fabrication: Steel with 20 gage minimum blades, steel and aluminum with 20 gage minimum frame, or aluminum extrusions, with factory baked enamel, prime coated or clear lacquer finish per design, color as selected.
- E. Damper: Integral, gang-operated, opposed blade type with removable key operator, operable from face where not individually connected to exhaust fans.
- F. Gymnasiums: Provide front pivoted or welded in place blades, securely fastened to be immobile.

2.9 CEILING GRID CORE EXHAUST AND RETURN REGISTERS/GRILLES

- A. Type: Fixed grilles of $\frac{1}{2}$ x $\frac{1}{2}$ x 1 inch louvers.
- B. Frame: Margin with countersunk screw mounting, or concealed mounting, Channel lay-in frame for suspended grid ceilings.
- C. Fabrication: Aluminum with factory clear lacquer baked enamel finish color to be selected.
- D. Damper: Integral, gang-operated, opposed-blade type with removable key operator, operable from face.

2.10 CEILING LINEAR EXHAUST AND RETURN GRILLES

- A. Type: Streamlined blades with 90 degree one-way or two-way deflection, $\frac{1}{8}$ x $\frac{3}{4}$ inch on $\frac{1}{4}$ or $\frac{1}{2}$ inch centers per design.
- B. Frame: $\frac{1}{4}$ inch margin, extra heavy for floor mounting, with countersunk screw or concealed mounting.
- C. 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 baked enamel, prime coated or clear lacquer finish per design, color to be selected.
- D. Damper: Integral, gang-operated, opposed blade type with removable key operator, operable from face.

2.11 WALL SUPPLY REGISTERS/GRILLES

- A. Type: Streamlined and individually adjustable blades, $\frac{3}{4}$ inch minimum depth, $\frac{3}{4}$ inch maximum spacing with spring or other device to set blades, vertical or horizontal face, single or double deflection per design
- B. Frame: Margin with countersunk screw concealed mounting and gasket
- C. 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 baked enamel, prime coat, clear lacquer finish per design, color to be selected.
- D. Damper: Integral, gang-operated opposed blade type with removable key operator, operable from face.
- E. Gymnasiums: Provide front pivoted or welded in place blades, securely fastened to be immobile.

2.12 WALL SUPPLY REGISTERS/GRILLES

- A. Type: Streamlined and individually adjustable curved blades to discharge air along face of grille with one way or two way deflection
- B. Frame: 1-1/4 inch margin with countersunk screw or concealed mounting and gasket per design
- C. Fabrication: Aluminum extrusions with factory clear lacquer or prime coat baked enamel finish, color to be selected.
- D. Damper: Integral, gang-operated, opposed blade type with removable key operator, operable from face.

2.13 WALL EXHAUST AND RETURN REGISTERS/GRILLES

- A. Type: Streamlined blades, $\frac{3}{4}$ inch minimum depth, $\frac{3}{4}$ inch maximum spacing, with spring or other device to set blades, vertical or horizontal face.
- B. Frame: 1-1/4 inch margin with countersunk screw or concealed mounting
- C. Fabrication: Steel with 20 gage minimum frames and 22 gage minimum blades with factory baked enamel, prime coated, or clear lacquer finish per design, color to be selected.

- D. Damper: Integral, gang-operated, opposed-blade type with removable key operator, operable from face.
- E. Gymnasiums: Provide front pivoted or welded in place blades, securely fastened to be immobile.

2.14 WALL GRID CORE EXHAUST AND RETURN REGISTERS/GRILLES

- A. Type: Fixed grilles of $\frac{1}{2}$ x $\frac{1}{2}$ x 1 inch louvers
- B. Frame: 1-1/4 inch margin with countersunk screw mounting, concealed mounting or lay in frame for suspended grid ceilings
- C. Fabrication: Aluminum with factory clear lacquer, baked enamel finish per design, color to be selected.
- D. Damper: Integral, gang-operated, opposed-blade type with removable key operator, operable from face.

2.15 LINEAR WALL REGISTERS/GRILLES

- A. Type: Streamlined blades with 0-15 degree deflection, $\frac{1}{8}$ x $\frac{3}{4}$ inch on $\frac{1}{4}$ or $\frac{1}{2}$ inch centers per design.
- B. Frame: 1-1/4 inch margin with countersunk screw or concealed mounting and gasket
- C. Fabrication: Aluminum extrusions with factory clear lacquer, prime coat baked enamel finish per design
- D. Damper: Integral gang-operated opposed blade or hinged single blade damper with removable key operator, operable from face per design.

2.16 LINEAR FLOOR SUPPLY REGISTERS/GRILLES

- A. Type: Streamlined blades with 0-15 degree deflection, $\frac{1}{8}$ x $\frac{3}{4}$ inch on $\frac{1}{4}$ or $\frac{1}{2}$ inch centers per design.
- B. Frame: 1-1/4 inch margin with countersunk screw or concealed mounting and gasket
- C. Fabrication: Aluminum extrusions with factory clear lacquer, prime coat baked enamel finish per design

- D. Damper: Integral gang-operated opposed blade or hinged single blade damper with removable key operator, operable from face per design.

2.17 FLOOR SUPPLY REGISTERS/GRILLES

- A. Individually adjustable or fixed blades, wide stamped border, single or double blade damper with setscrew adjustment per design.
- B. Fabricate of steel, welded construction, with factory baked enamel finish.

2.18 DOOR GRILLES

- A. Type: V-shaped louvers of 20 gage thick steel, 1 inch deep on ½ inch centers
- B. Frame: 20 gage steel with auxiliary frame to give finished appearance on both sides of door, with factory prime coat finish.

2.19 LOUVERS

- A. Louvers: As specified in Division 15: Mechanical.
- B. Type: 4 or 6 inch deep with blades per design and application on 45 degree slope with center baffle and return bend, heavy channel frame, bird screen with ½ inch square mesh for exhaust and ¾ inch for intake
- C. Fabrication: 16 gage thick galvanized steel thick extruded, welded assembly with factory prime coat, baked enamel, anodized or fluoropolymer spray finish per design and application, color to be selected
- D. Mounting: Furnish with interior, exterior, flat flange angle flange, screw holes in jambs or masonry strap anchors for installation per design.

2.20 LOUVER PENTHOUSE

- A. Fabricate louver penthouses with mitered corners and reinforce with structural angles.
- B. Louver Penthouse: As specified in Division 15: Mechanical.
Type: All welded assembly with 4 inch deep louvers, mitered corners with factory prime coat, baked enamel, anodized or fluoropolymer spray finish per design, color to be selected.

2.21 ROOF HOODS

- A. Fabricate air inlet or exhaust hoods in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible.
- B. Fabricate of reinforced galvanized steel, minimum 16 gage base and 20 gage hood. Provide removable hood; bird screen with ½ inch square mesh for exhaust and ¾ inch for intake and factory, prime coat, baked enamel finish per design, color to be selected.
- C. Mount unit on minimum 12 inch high curb base with insulation between duct and curb.
- D. Make hood outlet area minimum of twice throat area.

2.22 GOOSENECKS

- A. Fabricate in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible, of minimum of 18 gage galvanized steel.
- B. Mount on minimum 12 inch high curb base.

PART 3 –EXECUTION

3.1 EXAMINATION

- A. Section 01330 - Administrative Requirements: Coordination and project conditions.
- B. Verify inlet/outlet locations.
- C. Verify ceiling and wall systems are ready for installation.

3.2 INSTALLATION

- A. Install diffusers to ductwork with airtight connection.
- B. Provide balancing dampers on duct take-off to diffusers, and grilles and registers, despite whether dampers are specified as part of the diffuser, or grille and register assembly.
- C. Paint ductwork visible behind air outlets and inlets matte black. Refer to Section 09050.

3.3 INTERFACE WITH OTHER PRODUCTS

- A. Check location of outlets and inlets and make necessary adjustments in position to conform to architectural features, symmetry, and lighting arrangement.

END OF SECTION