

SECTION 233713 - DIFFUSERS, REGISTERS, AND GRILLES

TIPS:

To view non-printing **Editor's Notes** that provide guidance for editing, click on Masterworks/Single-File Formatting/Toggle/Editor's Notes.

To read **detailed research, technical information about products and materials, and coordination checklists**, click on Masterworks/Supporting Information.

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Round ceiling diffusers.
2. Rectangular and square ceiling diffusers.
3. Perforated diffusers.
4. Louver face diffusers.
5. Linear bar diffusers.
6. Linear slot diffusers.
7. Ceiling-integral continuous diffusers.
8. Light troffer diffusers.
9. Round induction diffusers.
10. Linear floor diffuser plenums.
11. Drum louvers.
12. Modular core supply grilles.
13. Continuous tubular diffusers.
14. Adjustable bar **[registers] [grilles] [registers and grilles]**.
15. Security **[registers] [grilles] [registers and grilles]**.
16. Fixed face **[registers] [grilles] [registers and grilles]**.
17. Linear bar grilles.

B. Related Sections:

1. Section 089116 "Operable Wall Louvers" and Section 089119 "Fixed Louvers" for fixed and adjustable louvers and wall vents, whether or not they are connected to ducts.
2. Section 233300 "Air Duct Accessories" for fire and smoke dampers and volume-control dampers not integral to diffusers, registers, and grilles.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated, include the following:
1. Data Sheet: Indicate materials of construction, finish, and mounting details; and performance data including throw and drop, static-pressure drop, and noise ratings.
 2. Diffuser, Register, and Grille Schedule: Indicate drawing designation, room location, quantity, model number, size, and accessories furnished.
- B. Samples for Initial Selection: For diffusers, registers, and grilles with factory-applied color finishes.
- C. Samples for Verification: For diffusers, registers, and grilles, in manufacturer's standard sizes to verify color selected.

1.4 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Reflected ceiling plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from Installers of the items involved:
1. Ceiling suspension assembly members.
 2. Method of attaching hangers to building structure.
 3. Size and location of initial access modules for acoustical tile.
 4. Ceiling-mounted items including lighting fixtures, diffusers, grilles, speakers, sprinklers, access panels, and special moldings.
 5. Duct access panels.
- B. Source quality-control reports.

PART 2 - PRODUCTS

2.1 CEILING DIFFUSERS

- A. Round Ceiling Diffuser <Insert drawing designation>:
1. [<Double click here to find, evaluate, and insert list of manufacturers and products.>](#)
 2. Devices shall be specifically designed for variable-air-volume flows.
 3. Material: [Steel] [Aluminum].
 4. Finish: [Baked enamel, white] [Baked enamel, color selected by Architect] [Anodized aluminum] <Insert finish>.
 5. Face Style: [Four] [Three] [Two] cone.
 6. Mounting: Duct connection.
 7. Pattern: [Fully adjustable] [Two-position horizontal].
 8. Dampers: [Radial opposed blade] [Butterfly] [Combination damper and grid].
 9. Accessories:
 - a. Equalizing grid.
 - b. Plaster ring.

- c. Safety chain.
- d. Wire guard.
- e. Sectorizing baffles.
- f. Operating rod extension.

B. Rectangular and Square Ceiling Diffusers <Insert drawing designation>:

1. [<Double click here to find, evaluate, and insert list of manufacturers and products.>](#)
2. Devices shall be specifically designed for variable-air-volume flows.
3. Material: [Steel] [Aluminum].
4. Finish: [Baked enamel, white] [Baked enamel, color selected by Architect] [Anodized aluminum] <Insert finish>.
5. Face Size: [24 by 24 inches (600 by 600 mm)] [20 by 20 inches (500 by 500 mm)] [12 by 12 inches (300 by 300 mm)] <Insert dimensions>.
6. Face Style: [Three cone] [Four cone] [Plaque].
7. Mounting: [Surface] [T-bar] [Snap in] [Spline] [Mounting panel].
8. Pattern: [Fixed] [Two position] [Adjustable].
9. Dampers: [Radial opposed blade] [Butterfly] [Combination damper and grid].
10. Accessories:
 - a. Equalizing grid.
 - b. Plaster ring.
 - c. Safety chain.
 - d. Wire guard.
 - e. Sectorizing baffles.
 - f. Operating rod extension.

C. Perforated Diffuser <Insert drawing designation>:

1. [<Double click here to find, evaluate, and insert list of manufacturers and products.>](#)
2. Devices shall be specifically designed for variable-air-volume flows.
3. Material: Steel backpan and pattern controllers, with [steel] [aluminum] face.
4. Finish: [Baked enamel, white] [Baked enamel, color selected by Architect] [Anodized aluminum] <Insert finish>.
5. Face Size: [12 by 12 inches (300 by 300 mm)] [24 by 12 inches (600 by 300 mm)] [36 by 12 inches (900 by 300 mm)] [48 by 12 inches (1200 by 300 mm)] [16 by 16 inches (400 by 400 mm)] [20 by 20 inches (500 by 500 mm)] [24 by 24 inches (600 by 600 mm)] [36 by 24 inches (900 by 600 mm)] [48 by 24 inches (1200 by 600 mm)] <Insert dimensions>.
6. Duct Inlet: [Round] [Square].
7. Face Style: [Flush] [Drop extended].
8. Mounting: [Surface] [T-bar] [Snap in] [Spline] [Mounting panel].
9. Pattern Controller: [Four louvered deflector patches] [Fixed with curved blades at inlet] [Adjustable with louvered pattern modules at inlet] [None].
10. Dampers: [Opposed blade] [Radial opposed blade] [Butterfly] [Combination damper and grid] [Combination volume and fire].
11. Accessories:
 - a. Equalizing grid.

- b. Plaster ring.
- c. Safety chain.
- d. Wire guard.
- e. Sectorizing baffles.
- f. Operating rod extension.

D. Louver Face Diffuser <Insert drawing designation>:

1. [<Double click here to find, evaluate, and insert list of manufacturers and products.>](#)
2. Devices shall be specifically designed for variable-air-volume flows.
3. Material: [Steel] [Aluminum].
4. Finish: [Baked enamel, white] [Baked enamel, color selected by Architect] [Anodized aluminum] <Insert finish>.
5. Face Size: <Insert inches (mm)>.
6. Mounting: [Surface] [Surface with beveled frame] [T-bar] [Snap in] [Spline] [Mounting panel].
7. Pattern: [One-way] [Two-way] [Two-way corner] [Three-way] [Four-way] [Adjustable] <Insert pattern> core style.
8. Dampers: [Radial opposed blade] [Butterfly] [Combination damper and grid].
9. Accessories:
 - a. Square to round neck adaptor.
 - b. Adjustable pattern vanes.
 - c. Throw reducing vanes.
 - d. Equalizing grid.
 - e. Plaster ring.
 - f. Safety chain.
 - g. Wire guard.
 - h. Sectorizing baffles.
 - i. Operating rod extension.

2.2 CEILING LINEAR SLOT OUTLETS

A. Linear Bar Diffuser <Insert drawing designation>:

1. [<Double click here to find, evaluate, and insert list of manufacturers and products.>](#)
2. Devices shall be specifically designed for variable-air-volume flows.
3. Material: [Steel] [Aluminum] [Stainless steel].
4. Finish: [Baked enamel, white] [Baked enamel, color selected by Architect] <Insert finish>.
5. Narrow Core Spacing Arrangement: 1/8-inch- (3-mm-) thick blades spaced 1/4 inch (6 mm) apart, [zero] [15]-degree deflection.
6. Wide Core Spacing Arrangement: 1/8-inch- (3-mm-) thick blades spaced 1/2 inch (13 mm) apart, [zero] [15]-degree deflection.
7. Wide Core Spacing Arrangement: 3/16-inch- (5-mm-) thick blades spaced 1/2 inch (13 mm) apart, [zero] [15] [30]-degree deflection.
8. Pencil-Proof Core Spacing Arrangement: 3/16-inch- (5-mm-) thick blades spaced 7/16 inch (11 mm) apart, [zero] [15] [30]-degree deflection.

9. [One] [Two]-Way Deflection Vanes: Extruded construction fixed louvers with removable core.
10. Frame: [1-1/4 inches (32 mm)] [1 inch (25 mm)] [3/4 inch (19 mm)] [1/2 inch (13 mm)] [3/16 inch (5 mm)] wide.
11. Mounting Frame: [Filter] <Insert frame size and style>.
12. Mounting: [Countersunk screw] [Concealed bracket] [Spring clip].
13. Damper Type: [Adjustable opposed-blade assembly] [Hinged single blade].
14. Accessories: [Plaster frame] [Directional vanes] [Alignment pins] [Core clips] [Blank-off strips].

B. Linear Slot Diffuser <Insert drawing designation>:

1. [<Double click here to find, evaluate, and insert list of manufacturers and products.>](#)
2. Devices shall be specifically designed for variable-air-volume flows.
3. Material - Shell: [Steel] [Aluminum], [insulated] [noninsulated].
4. Material - Pattern Controller and Tees: Aluminum.
5. Finish - Face and Shell: [Baked enamel, black] <Insert finish>.
6. Finish - Pattern Controller: [Baked enamel, black] <Insert finish>.
7. Finish - Tees: [Baked enamel, white] [Baked enamel, color selected by Architect] <Insert finish>.
8. Slot Width: [1/2 inch (13 mm)] [3/4 inch (19 mm)] [1 inch (25 mm)] [1-1/2 inches (38 mm)].
9. Number of Slots: [One] [Two] [Three] [Four] <Insert number>.
10. Length: [24 inches (600 mm)] [30 inches (750 mm)] [36 inches (900 mm)] [48 inches (1200 mm)] [60 inches (1500 mm)].
11. Accessories: [Plaster frame] [T-bar slot] [Center notch] [T-bar on inlet side] [T-bar on both sides] [T-bar clip on one side] [T-bar clips on both sides].

C. Ceiling-Integral Continuous Diffuser <Insert drawing designation>:

1. [<Double click here to find, evaluate, and insert list of manufacturers and products.>](#)
2. Slot Width: [1 inch (25 mm)] [1-1/2 inches (38 mm)] [2 inches (50 mm)] [2-1/2 inches (63 mm)] [3 inches (76 mm)].
3. Section Length: [12 feet (3.7 m)] <Insert dimension>.
4. Straight and curved sections as required to accommodate layout.
5. Mitered tees and corners.
6. Pattern Controllers: [24 inches (600 mm)] <Insert dimension> o.c.
7. Material: Aluminum, extruded, heavy wall.
8. Finishes:
 - a. Exterior: Standard white.
 - b. Interior: Standard black.
9. Throw: [Standard] [High].
10. Mounting: [Ceiling] [Sidewall].
11. Plenum: [Noninsulated] [Insulated].
12. Other Features:
 - a. Painted interior.
 - b. Blank-offs.

D. Light Troffer Diffuser <Insert drawing designation>:

1. [<Double click here to find, evaluate, and insert list of manufacturers and products.>](#)
2. Devices shall be specifically designed for variable-air-volume flows.
3. Material: Steel[**with external insulation**].
4. Finish: [None] [Black enamel on visible surfaces] <Insert finish>.
5. Slot Width: [1/2 inch (13 mm)] [3/4 inch (19 mm)] [1 inch (25 mm)] [1-1/2 inches (38 mm)].
6. Number of Sides: [One] [Two].
7. Length: [24 inches (600 mm)] [36 inches (900 mm)] [48 inches (1200 mm)].
8. Pattern: [Fixed] [Adjustable].
9. Inlet: [Top] [Side].
10. Inlet Size: [5 inches (125 mm)] [6 inches (150 mm)] [8 inches (200 mm)].

2.3 UNDERFLOOR AIR DISTRIBUTION DIFFUSERS

A. Round Induction Diffusers <Insert drawing designation>:

1. [<Double click here to find, evaluate, and insert list of manufacturers and products.>](#)
2. Airflow Principle: Swirl-pattern induction.
3. Material: Plastic, high impact, and resistant to cart and foot traffic.
4. Color: [Gray] [Black].
5. Components:
 - a. Diffuser core.
 - b. Flow regulator.
 - c. Dirt and liquid catch pan.
 - d. Spacer flange.
 - e. Gasketed, underfloor compression ring.

B. Linear Floor Diffuser Plenums <Insert drawing designation>:

1. [<Double click here to find, evaluate, and insert list of manufacturers and products.>](#)
2. Material: Steel.
3. Finish: White baked acrylic.
4. Deflection: [Zero] [15] degrees.
5. Components:
 - a. Aluminum diffuser core.
 - b. Diffuser frame.
 - c. Plenum, 0.034-inch (0.85-mm) steel.

2.4 HIGH-CAPACITY DIFFUSERS

A. Drum Louver <Insert drawing designation>:

1. [<Double click here to find, evaluate, and insert list of manufacturers and products.>](#)
2. Airflow Principle: Extended distance for high airflow rates.

3. Material: Aluminum, heavy gage extruded.
4. Finish: White baked acrylic.
5. Border: 1-1/4-inch (32-mm) width with countersunk screw holes.
6. Gasket between drum and border.
7. Body: Drum shaped; adjustable vertically.
8. Blades: Individually adjustable horizontally.
9. Mounting: Surface to [duct] [wall].
10. Inlet Width: [6 inches (150 mm)] [10 inches (250 mm)] [12 inches (300 mm)] [15 inches (380 mm)] <Insert dimension>.
11. Inlet Length: [12 inches (300 mm)] [24 inches (600 mm)] [36 inches (900 mm)] [60 inches (1500 mm)] <Insert dimension>.
12. Accessories:
 - a. Opposed-blade steel damper.
 - b. Duct-mounting collars with countersunk screw holes.

B. Modular Core Supply Grilles <Insert drawing designation>:

1. <Double click here to find, evaluate, and insert list of manufacturers and products.>
2. Throw: Extended distance for airflow rates.
3. Material: Steel.
4. Grilles per Unit: [One] [Two] [Three] [Four].
5. Finish: White baked acrylic.
6. Border: 1-1/2-inch (38-mm) width with countersunk screw holes.
7. Blades:
 - a. Airfoil, individually adjustable horizontally.
 - b. Double deflection.
 - c. Set in modules.
8. Modules: Removable; rotatable.
9. Mounting: Surface.
10. Accessory: Opposed-blade steel damper.

2.5 FLEXIBLE DIFFUSION OUTLETS

A. Continuous Tubular Diffuser <Insert drawing designation>:

1. <Double click here to find, evaluate, and insert list of manufacturers and products.>
2. Material: [Flame-retardant, woven polyethylene fabric] [Flame-retardant, coated polyester and fiberglass fabric] [Flame-retardant, permeable polyester and fiberglass fabric] [Polyethylene].
3. Duct Connection: Round.
4. Duct Connection Size: <Insert inches (mm)>.
5. Diffusion Hole Size: <Insert inches (mm)>.
6. Diffusion Hole Frequency - Number per 100 Feet (30 m): <Insert number>.
7. Accessories:
 - a. Quick-connect joint.
 - b. Snap hooks.

- c. Cleanout zipper.
- d. Condensate drain.

2.6 REGISTERS AND GRILLES

A. Adjustable Bar Register <Insert drawing designation>:

1. [<Double click here to find, evaluate, and insert list of manufacturers and products.>](#)
2. Material: [Steel] [Aluminum] [Stainless steel].
3. Finish: [Baked enamel, white] [Baked enamel, color selected by Architect] <Insert finish>.
4. Face Blade Arrangement: [Horizontal] [Vertical] spaced [3 inches (76 mm)] [1-1/2 inches (38 mm)] [3/4 inch (19 mm)] [1/2 inch (13 mm)] apart.
5. Core Construction: [Integral] [Removable].
6. Rear-Blade Arrangement: [Horizontal] [Vertical] spaced [3/4 inch (19 mm)] [1/2 inch (13 mm)] apart.
7. Frame: [1-1/4 inches (32 mm)] [1 inch (25 mm)] wide.
8. Mounting Frame: [Filter] <Insert frame size and style>.
9. Mounting: [Countersunk screw] [Concealed] [Lay in].
10. Damper Type: [Adjustable opposed blade] [NRTL listed, opposed blade, spring closing, and with fusible link for 160 deg F (71 deg C)].
11. Accessories:
 - a. [Front] [Rear]-blade gang operator.
 - b. Filter.

B. Adjustable Bar Grille <Insert drawing designation>:

1. [<Double click here to find, evaluate, and insert list of manufacturers and products.>](#)
2. Material: [Steel] [Aluminum] [Stainless steel].
3. Finish: [Baked enamel, white] [Baked enamel, color selected by Architect] <Insert finish>.
4. Face Blade Arrangement: [Horizontal] [Vertical] spaced [3 inches (76 mm)] [1-1/2 inches (38 mm)] [3/4 inch (19 mm)] [1/2 inch (13 mm)] apart.
5. Core Construction: [Integral] [Removable].
6. Rear-Blade Arrangement: [Horizontal] [Vertical] spaced [3/4 inch (19 mm)] [1/2 inch (13 mm)] apart.
7. Frame: [1-1/4 inches (32 mm)] [1 inch (25 mm)] wide.
8. Mounting Frame: [Filter] <Insert frame size and style>.
9. Mounting: [Countersunk screw] [Concealed] [Lay in].

C. Security Register <Insert drawing designation>:

1. [<Double click here to find, evaluate, and insert list of manufacturers and products.>](#)
2. Security Level: [Maximum] [Medium] [Minimum] [and suicide deterrent].
3. Application: [Ducted return] [Air transfer] [Barrier].
4. Material: [Steel] [Aluminum].
5. Material Thickness: [0.19 inch (4.8 mm)] <Insert dimension>.
6. Finish: [Baked enamel, white] [Baked enamel, color selected by Architect] <Insert finish>.

7. Face Arrangement:

- a. Shape: [Square] [Rectangular] [Round].
- b. Design: [Fixed bar] [Perforated] [Lattice].
- c. Frame: [Yes] [No].
- d. Deflection: [Zero] [38] degrees.
- e. Core: [None] [Louvered].
- f. 3/16-inch- (5-mm-) thick, front lattice plate with 2-by-2-inch- (50-by-50-mm-) square holes and 1-inch (25-mm) frets, 0.135-inch (3.43-mm) wire mesh, and 1/4-inch- (6-mm-) thick backer plate.
- g. 3/16-inch- (5-mm-) thick, perforated faceplate with 5/16-inch- (8-mm-) diameter holes spaced 7/16 inch (11 mm) o.c., staggered at 60 degrees.
- h. 1-1/2-inch (38-mm) bars and mandrel tubes and rods with [zero] [15]-degree deflection in 1-1/4-by-1-1/4-by-3/16-inch (32-by-32-by-5-mm) angle border.
- i. 1-3/8-inch (35-mm) bars and double mandrel tubes with [zero] [15]-degree deflection in 1-3/4-inch (45-mm) angle border.

- 8. Damper Operation: [None] [Face operated] [Rear operated].
- 9. Damper Type: [Adjustable opposed blade] [NRTL listed, opposed blade, spring closing, and with fusible link for 160 deg F (71 deg C)].
- 10. Wall Sleeve: [3/16 inch (5 mm) welded to face] [1/8 inch (3 mm) welded to face] [Mechanically fastened to border].
- 11. Mounting: [1-by-1-by-3/16-inch (25-by-25-by-5-mm) retaining angle frame] [1-1/4-by-1-1/4-by-3/16-inch (32-by-32-by-5-mm) retaining angle frame] [1-1/4-by-1-1/4-by-3/16-inch (32-by-32-by-5-mm) cast-in-place frame and tamperproof machine screws].

D. Security Grille <Insert drawing designation>:

- 1. [<Double click here to find, evaluate, and insert list of manufacturers and products.>](#)
- 2. Security Level: [Maximum] [Medium] [Minimum] [and suicide deterrent].
- 3. Application: [Ducted return] [Air transfer] [Barrier].
- 4. Material: [Steel] [Aluminum].
- 5. Material Thickness: [0.19 inch (4.8 mm)] <Insert dimension>.
- 6. Finish: [Baked enamel, white] [Baked enamel, color selected by Architect] <Insert finish>.
- 7. Face Arrangement:
 - a. Shape: [Square] [Rectangular] [Round].
 - b. Design: [Fixed bar] [Perforated] [Lattice].
 - c. Frame: [Yes] [No].
 - d. Deflection: [Zero] [38] degrees.
 - e. Core: [None] [Louvered].
 - f. 3/16-inch- (5-mm-) thick, front lattice plate with 2-by-2-inch- (50-by-50-mm-) square holes and 1-inch (25-mm) frets, 0.135-inch (3.43-mm) wire mesh, and 1/4-inch- (6-mm-) thick backer plate.
 - g. 3/16-inch- (5-mm-) thick perforated faceplate with 5/16-inch- (8-mm-) diameter holes spaced 7/16 inch (11 mm) o.c., staggered at 60 degrees.
 - h. 1-1/2-inch (38-mm) bars and mandrel tubes and rods with [zero] [15]-degree deflection in 1-1/4-by-1-1/4-by-3/16-inch (32-by-32-by-5-mm) angle border.

- i. 1-3/8-inch (35-mm) bars and double mandrel tubes with [zero] [15]-degree deflection in 1-3/4-inch (45-mm) angle border.
 - 8. Wall Sleeve: [3/16 inch (5 mm) welded to face] [1/8 inch (3 mm) welded to face] [Mechanically fastened to border].
 - 9. Mounting: [1-by-1-by-3/16-inch (25-by-25-by-5-mm) retaining angle frame] [1-1/4-by-1-1/4-by-3/16-inch (32-by-32-by-5-mm) retaining angle frame] [1-1/4-by-1-1/4-by-3/16-inch (32-by-32-by-5-mm) cast-in-place frame and tamperproof machine screws].
- E. Fixed Face Register <Insert drawing designation>:
- 1. <Double click here to find, evaluate, and insert list of manufacturers and products.>
 - 2. Material: [Steel] [Aluminum].
 - 3. Finish: [Baked enamel, white] [Baked enamel, color selected by Architect] <Insert finish>.
 - 4. Face Arrangement: [1/2-by-1/2-by-1/2-inch (13-by-13-by-13-mm) grid] [Perforated] core.
 - 5. Core Construction: [Integral] [Removable].
 - 6. Frame: [1-1/4 inches (32 mm)] [1 inch (25 mm)] wide.
 - 7. Mounting Frame: [Filter] <Insert frame size and style>.
 - 8. Mounting: [Countersunk screw] [Concealed] [Lay in].
 - 9. Damper Type: [Adjustable opposed blade] [NRTL listed, opposed blade, spring closing, and with fusible link for 160 deg F (71 deg C)].
 - 10. Accessory: Filter.
- F. Fixed Face Grille <Insert drawing designation>:
- 1. <Double click here to find, evaluate, and insert list of manufacturers and products.>
 - 2. Material: [Steel] [Aluminum].
 - 3. Finish: [Baked enamel, white] [Baked enamel, color selected by Architect] <Insert finish>.
 - 4. Face Arrangement: [1/2-by-1/2-by-1/2-inch (13-by-13-by-13-mm) grid] [Perforated] core.
 - 5. Core Construction: [Integral] [Removable].
 - 6. Frame: [1-1/4 inches (32 mm)] [1 inch (25 mm)] wide.
 - 7. Mounting Frame: [Filter] <Insert frame size and style>.
 - 8. Mounting: [Countersunk screw] [Concealed] [Lay in].
 - 9. Accessory: Filter.
- G. Linear Bar Grille <Insert drawing designation>:
- 1. <Double click here to find, evaluate, and insert list of manufacturers and products.>
 - 2. Material: [Steel] [Aluminum].
 - 3. Finish: [Baked enamel, white] [Baked enamel, color selected by Architect] <Insert finish>.
 - 4. Face Arrangement: [1/2-by-1/2-by-1/2-inch (13-by-13-by-13-mm) grid] [Perforated] core.
 - 5. Distribution plenum.
 - a. Internal insulation.

- b. Inlet damper.
- 6. Frame: **[1-1/4 inches (32 mm)] [1 inch (25 mm)]** wide.
- 7. Mounting Frame: **[Filter]** <Insert frame size and style>.
- 8. Mounting: **[Countersunk screw]** **[Concealed]** **[Lay in]**.
- 9. Damper Type: **[Adjustable opposed blade]** **[NRTL listed, opposed blade, spring closing, and with fusible link for 160 deg F (71 deg C)]**.

2.7 SOURCE QUALITY CONTROL

- A. Verification of Performance: Rate diffusers, registers, and grilles according to ASHRAE 70, "Method of Testing for Rating the Performance of Air Outlets and Inlets."

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas where diffusers, registers, and grilles are to be installed for compliance with requirements for installation tolerances and other conditions affecting performance of equipment.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install diffusers, registers, and grilles level and plumb.
- B. Ceiling-Mounted Outlets and Inlets: Drawings indicate general arrangement of ducts, fittings, and accessories. Air outlet and inlet locations have been indicated to achieve design requirements for air volume, noise criteria, airflow pattern, throw, and pressure drop. Make final locations where indicated, as much as practical. For units installed in lay-in ceiling panels, locate units in the center of panel. Where architectural features or other items conflict with installation, notify Architect for a determination of final location.
- C. Install diffusers, registers, and grilles with airtight connections to ducts and to allow service and maintenance of dampers, air extractors, and fire dampers.

3.3 ADJUSTING

- A. After installation, adjust diffusers, registers, and grilles to air patterns indicated, or as directed, before starting air balancing.

END OF SECTION 233713