

Suggested Specifications

Price SCD Square Cone Diffusers

Division 23 – Heating, Ventilating, and Air Conditioning

Section 23 37 13 – Diffusers, Registers, and Grilles

The following specification is for a defined application. Price would be pleased to assist in developing a specification for your specific need.

PART 1 – GENERAL

1.01 Section includes:

- A. Square Cone Diffusers

1.02 Related Requirements

- A. Section 01 30 00 – Administrative Requirements
- B. Section 01 40 00 – Quality Requirements
- C. Section 01 60 00 – Product Requirements
- D. Section 01 74 21 – Construction/Demolition Waste Management and Disposal
- E. Section 01 78 00 – Closeout Submittals
- F. Section 01 79 00 – Demonstration and Training

1.03 Reference Standards

- A. All referenced standards and recommended practices in this section pertain to the most recent publication thereof, including all addenda and errata.
- B. ASHRAE 70 – Method of Testing the Performance of Air Outlets and Air Inlets
- C. ASTM 610 – Standard Practice for Evaluating Degree of Rusting on Painted Steel Surfaces
- D. ASTM 714 – Test Method for Evaluating Degree of Blistering of Paints
- E. ASTM D1308 – Standard Test Method for Effect of Household Chemicals on Clear and Pigmented Organic Finishes
- F. ASTM D1654 – Standard Test Method for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments
- G. ASTM D4752 – Standard Practice for Measuring MEK Resistance of Ethyl Silicate (Inorganic) Zinc-Rich Primers by Solvent Rub
- H. NFPA 90A – Standard for the Installation of Air-Conditioning and Ventilating Systems
- I. UL/ULC – Underwriters Laboratories Fire Resistance Directory/Underwriters Laboratories of Canada Equipment and Materials Directory, if applicable.

1.04 Submittals

- A. See Section 01 30 00 – Administrative Requirements for submittal procedures.
- B. Product Data: Provide data indicating configuration, general assembly, and materials used in fabrication. Include catalog performance ratings that indicate airflow, and NC designation.
- C. Shop Drawings: Indicate configuration, general assembly, and materials used in fabrication.
- D. Project Record Documents: Record actual locations of units and control components.
- E. Operation and Maintenance Data: Include manufacturer's descriptive literature, operating instructions (if applicable), and maintenance and repair data.
- F. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.
- G. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.

1.06 Quality Assurance

- A. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section, with minimum ten years of documented experience.

1.07 Warranty

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Provide 12 month manufacturer warranty from date of shipment of diffusers.

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PART 2 – PRODUCTS

2.01 Manufacturer

- A. Basis of Design: Price Industries, Inc.
 - 1. Square Cone Diffusers: Models SCD, SCDAS, ASCD
 - 2. Adjustable Square Cone Diffusers: Models SCDA, ASCDA
 - 3. Fire-Rated Square Cone Diffusers: Model SCD-FR
 - 4. Adjustable Fire-Rated Square Cone Diffusers: Model SCDA-FR
- B. General:
 - 1. The square cone diffuser shall be supplied to deliver a 360 degree radial, horizontal airflow pattern. The cones and backpan shall be one-piece die-formed with smooth, aerodynamically designed surfaces and no corner joints. This contoured design shall protect the ceiling and help to prevent smudging and streaking.

2.02 Square Cone Diffusers

- A. Description:
 - 1. Furnish and install Price model [SCD – steel], [SCDAS – Aluminized Steel] or [ASCD – aluminum] square cone ceiling diffusers of sizes and mounting types designated by the plans and air distribution schedule.
- B. Construction:
 - 1. Diffusers shall be [steel], [aluminized steel], or [aluminum] construction, and shall consist of a seamless, one-piece, precision formed backpan that incorporates a round inlet collar of sufficient length for connecting rigid or flexible duct.
 - 2. The diffuser shall integrate with all duct sizes shown on the plans without affecting the face size and appearance of the unit.
 - 3. An inner cone assembly shall consist of [3 cones] or [optional 4 cones on 24 x 24 size] which drop below the ceiling plane to assure optimal VAV air diffusion performance. The inner cone assembly shall be completely removable from the diffuser face to allow for full access to any dampers or other ductwork components located near the diffuser neck.
 - 4. [Optional] The diffuser shall be supplied with a fixed core (Size 24 x 24 only).
 - 5. The diffuser ceiling module size shall be (**select one**):
 - a. 24 x 24 inches (600 x 600 millimeters) [**must select this size for 4th cone option**]
 - b. 20 x 20 inches (500 x 500 millimeters)
 - c. 12 x 12 inches (300 x 300 millimeters)
- C. Paint Specification:
 - 1. Paint finish shall be (**select one**):
 - a. All components shall have a baked-on powder coat finish.
 - 1. The paint finish must demonstrate no degradation when tested in accordance with ASTM D1308 (covered and spot immersion) and ASTM D4752 (MEK double rub) paint durability tests.
 - 2. The paint film thickness shall be a minimum of 2.0 mils.
 - 3. The finish shall have a hardness of 2H.
 - 4. The finish shall withstand a minimum salt spray exposure of 500 hours with no measurable creep in accordance with ASTM D1654, and 1000 hours of exposure with no rusting or blistering as per ASTM D610 and ASTM D714.
 - 5. The finish shall have an impact resistance of 80 inch-pounds.
 - b. All components shall have a custom finish in a color to match a customer supplied sample.
- D. Mounting Frame:
 - 1. The diffuser mounting frame shall be suitable for lay-in or surface mount applications with the following frame style (**select one**):
 - a. 9/16 inch wide T-bar with drop frame
 - b. Concealed spline
 - c. 15/16 inch wide flat T-bar
 - d. Snap-in T-bar
 - e. 9/16 wide tegular T-bar
 - f. Clip-on Recessed Spline
 - g. Surface mount
- E. Options (**select all that apply**):
 - 1. Insulated Back pan (**select one**):
 - a. AFI –The diffuser back pan shall be externally insulated with 1/2 inch fiberglass with foil/scrim vapor barrier which meets the requirements of UL 181 and NFPA 90A. (**applies to 20x20 and 500x500 modules only**)
 - b. R6 – The diffuser back pan shall be externally insulated with a molded heavy duty foil/scrim vapor barrier with an R-value of six. The insulation shall meet the requirements of UL 181 and NFPA 90A. (**applies to 12x12, 300x300, 24x24 and 600x600 modules only**)
 - 2. Steel Panel:
 - a. The diffuser shall be mounted in a steel panel for lay-in applications.
 - b. The panel size shall be based on the diffuser size selected.
 - 1. For 24 x 24 diffusers, the panel shall be (**select one**):
 - a. 24 x 48

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- b. 30 x 30
 2. For 12 x 12 diffusers, the panel shall be **(select one)**:
 - a. 12 x 24
 - b. 12 x 48
 - c. 16 x 16
 - d. 20 x 20
 - e. 24 x 24
3. Beaded Extended Neck:
 - a. The diffuser shall be supplied with a beaded neck extended to a depth of 2-1/2 inches.
4. Damper:
 - a. The diffuser shall be supplied with a steel volume control damper **(select one)**:
 1. Radial opposed blade damper (VCR7)
 2. Full flow damper, duct mounted (VCR8)
 3. Full flow damper, diffuser mounted (VCR8E)
 4. Radial damper, diffuser mounted (VCR9)
5. Magnetic Resonance Imaging (MRI) Construction **(applies to Models ASCD and ASCDA only)**:
 - a. The diffuser shall be supplied with an all-aluminum construction for MRI applications.
 - b. The diffuser module shall be 24 x 24 inches with a [T-bar] **or** [Narrow member] frame style.
 - c. The MRI option does not include a volume control damper.

2.03 Adjustable Square Cone Diffusers

- A. Description:
 1. Furnish and install Price model [SCDA steel] **or** [ASDA aluminum] adjustable square cone ceiling diffusers of sizes and mounting types designated by the plans and air distribution schedule.
- B. Construction:
 1. Diffusers shall be [steel], or [aluminum] construction, and shall consist of a seamless, one-piece, precision formed backpan that incorporates a round inlet collar of sufficient length for connecting rigid or flexible duct and an outer frame which is recessed from the ceiling plane to allow for field adjustment of the airflow discharge from fully horizontal to fully vertical.
 2. The diffuser shall integrate with all duct sizes shown on the plans without affecting the face size and appearance of the unit.
 3. An inner cone assembly shall consist of [3 cones] or *[optional 4 cones on 24 x 24 size]* which drop below the ceiling plane to assure optimal VAV air diffusion performance. The inner cone assembly shall be completely removable from the diffuser face to allow for full access to any dampers or other ductwork components located near the diffuser neck.
 4. Non-protrusive airflow directional tabs shall be provided on the back of the inner cones which may be positioned for either horizontal or vertical discharge.
 5. The diffuser ceiling module size shall be **(select one)**:
 - a. 24 x 24 inches (600 x 600 millimeters) **[must select this size for 4th cone option]**
 - b. 20 x 20 inches (500 x 500 millimeters)
 - c. 12 x 12 inches (300 x 300 millimeters)
- C. Paint Specification:
 1. Paint finish shall be **(select one)**:
 - a. All components shall have a baked-on powder coat finish.
 1. The paint finish must demonstrate no degradation when tested in accordance with ASTM D1308 (covered and spot immersion) and ASTM D4752 (MEK double rub) paint durability tests.
 2. The paint film thickness shall be a minimum of 2.0 mils.
 3. The finish shall have a hardness of 2H.
 4. The finish shall withstand a minimum salt spray exposure of 500 hours with no measurable creep in accordance with ASTM D1654, and 1000 hours of exposure with no rusting or blistering as per ASTM D610 and ASTM D714.
 5. The finish shall have an impact resistance of 80 inch-pounds.
 - b. All components shall have a custom finish in a color to match a customer supplied sample.
- D. Mounting Frame:
 1. The diffuser mounting frame shall be suitable for lay-in or surface mount applications with the following frame style (select one):
 - a. 9/16 inch wide T-bar with drop frame
 - b. Concealed spline
 - c. 15/16 inch wide flat T-bar
 - d. Snap-in T-bar
 - e. 9/16 wide tegular T-bar
 - f. Clip-on Recessed Spline
 - g. Surface mount
- E. Volume Control Damper:
 1. The diffuser shall be supplied with a steel volume control damper **(select one)**:

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- a. Radial opposed blade damper (VCR7)
- b. Full flow damper, duct mounted (VCR8)
- c. Full flow damper, diffuser mounted (VCR8E)
- d. Radial damper, diffuser mounted (VCR9)

F. Options (**select all that apply**):

1. Beaded Extended Neck:
 - a. The diffuser shall be supplied with a beaded neck extended to a depth of 2-1/2 inches.

2.04 Fire-Rated Square Cone Diffusers

A. Description:

1. Furnish and install Price model SCD-FR fire-rated square cone ceiling diffusers of sizes and mounting types designated by the plans and air distribution schedule.
2. Diffusers shall be Fire-Rated Assemblies listed in the UL, Underwriters Laboratories Fire Resistance Directory and in the ULC, Underwriters Laboratories of Canada Equipment and Materials Directory.
3. Diffusers shall meet UL time versus temperature test criteria and NFPA 90A requirements.
4. This design is intended for use in an exposed grid suspended ceiling (T-bar Lay-in) with up to a three-hour rating and must be installed in accordance with the installation instructions.

B. Construction:

1. Diffusers shall be steel construction, and shall consist of a seamless, one-piece, precision formed backpan that incorporates a round inlet collar of sufficient length for connecting rigid or flexible duct.
2. The diffuser shall integrate with all duct sizes shown on the plans without affecting the face size and appearance of the unit.
3. An inner cone assembly shall consist of [3 cones] or [*optional* 4 cones] which drop below the ceiling plane to assure optimal VAV air diffusion performance. The inner cone assembly shall be completely removable from the diffuser face to allow for full access to any dampers or other ductwork components located near the diffuser neck.
4. The diffuser ceiling module size shall be (**select one**):
 - a. 24 x 24 inches (600 x 600 millimeters) [**must select this size for 4th cone option**]
 - b. 20 x 20 inches (500 x 500 millimeters)
 - c. 12 x 12 inches (300 x 300 millimeters)

C. Paint Specification:

1. Paint finish shall be (**select one**):
 - a. All components shall have a baked-on powder coat finish.
 1. The paint finish must demonstrate no degradation when tested in accordance with ASTM D1308 (covered and spot immersion) and ASTM D4752 (MEK double rub) paint durability tests.
 2. The paint film thickness shall be a minimum of 2.0 mils.
 3. The finish shall have a hardness of 2H.
 4. The finish shall withstand a minimum salt spray exposure of 500 hours with no measurable creep in accordance with ASTM D1654, and 1000 hours of exposure with no rusting or blistering as per ASTM D610 and ASTM D714.
 5. The finish shall have an impact resistance of 80 inch-pounds.
 - b. All components shall have a custom finish in a color to match a customer supplied sample.

D. Damper:

1. The diffuser shall be supplied with a galvanized steel, non-adjustable, butterfly-type ceiling radiation damper.

E. Thermal Blanket:

1. The diffuser shall be externally wrapped with a non-asbestos thermal blanket.

F. Mounting Frame:

1. The diffuser mounting frame shall be suitable for lay-in or surface mount applications with a 15/16 inch fire-rated T-bar frame style.

G. Options (**select all that apply**):

1. Volume Control:
 - a. The diffuser shall be supplied with a steel volume control damper that is room side adjustable with an allen key for balancing.
2. Fusible Link:
 - a. The diffuser shall be supplied with a fusible link rated for (**select one**):
 1. 165 degrees Fahrenheit.
 2. 212 degrees Fahrenheit.

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2.05 Adjustable Fire-Rated Square Cone Diffusers

- A. Description:
1. Furnish and install Price model SCDA-FR adjustable fire-rated square cone ceiling diffusers of sizes and mounting types designated by the plans and air distribution schedule.
- B. Construction:
1. Diffusers shall be steel construction, and shall consist of a seamless, one-piece, precision formed backpan that incorporates a round inlet collar of sufficient length for connecting rigid or flexible duct and an outer frame which is recessed from the ceiling plane to allow for field adjustment of the airflow discharge from fully horizontal to fully vertical.
 2. The diffuser shall integrate with all duct sizes shown on the plans without affecting the face size and appearance of the unit.
 3. An inner cone assembly shall consist of [3 cones] or [optional 4 cones] which drop below the ceiling plane to assure optimal VAV air diffusion performance. The inner cone assembly shall be completely removable from the diffuser face to allow for full access to any dampers or other ductwork components located near the diffuser neck.
 4. Non-protrusive airflow directional tabs shall be provided on the back of the inner cones which may be positioned for either horizontal or vertical discharge.
 5. The diffuser ceiling module size shall be (**select one**):
 - a. 24 x 24 inches (600 x 600 millimeters) [**must select this size for 4th cone option**]
 - b. 20 x 20 inches (500 x 500 millimeters)
 - c. 12 x 12 inches (300 x 300 millimeters)
- C. Paint Specification:
1. Paint finish shall be (**select one**):
 - a. All components shall have a baked-on powder coat finish.
 1. The paint finish must demonstrate no degradation when tested in accordance with ASTM D1308 (covered and spot immersion) and ASTM D4752 (MEK double rub) paint durability tests.
 2. The paint film thickness shall be a minimum of 2.0 mils.
 3. The finish shall have a hardness of 2H.
 4. The finish shall withstand a minimum salt spray exposure of 500 hours with no measurable creep in accordance with ASTM D1654, and 1000 hours of exposure with no rusting or blistering as per ASTM D610 and ASTM D714.
 5. The finish shall have an impact resistance of 80 inch-pounds.
 - b. All components shall have a custom finish in a color to match a customer supplied sample.
- D. Damper:
1. The diffuser shall be supplied with a galvanized steel, non-adjustable, butterfly-type ceiling radiation damper.
- E. Thermal Blanket:
1. The diffuser shall be externally wrapped with a non-asbestos thermal blanket.
- F. Mounting Frame:
1. The diffuser mounting frame shall be suitable for lay-in or surface mount applications with a 15/16 inch fire-rated T-bar frame style.
- G. Options (**select all that apply**):
1. Volume Control:
 - a. The diffuser shall be supplied with a steel volume control damper that is room side adjustable with an allen key for balancing.
 2. Fusible Link:
 - a. The diffuser shall be supplied with a fusible link rated for (**select one**):
 1. 165 degrees Fahrenheit.
 2. 212 degrees Fahrenheit.

PART 3 – EXECUTION

3.01 Examination

- A. Verify that conditions are suitable for installation.
- B. Verify that field measurements are as shown on the drawings.

3.02 Installation

- A. Install in accordance with manufacturer's instructions.
- B. See drawings for the size(s) and locations of diffusers.

3.03 Field Quality Control

- A. See Section 01 40 00 – Quality Requirements for additional requirements.

3.05 Cleaning

- A. See Section 01 74 19 – Construction Waste Management and Disposal for additional requirements.

3.06 Closeout Activities

- A. See Section 01 78 00 – Closeout Submittals for closeout documentation requirements.
- B. See Section 01 79 00 – Demonstration and Training for additional requirements.