**Price SPD Square Plaque 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. **Section includes**:
1. Square Plaque Diffusers
	1. **Related Requirements**
2. Section 01 30 00 – Administrative Requirements
3. Section 01 40 00 – Quality Requirements
4. Section 01 60 00 – Product Requirements
5. Section 01 74 21 – Construction/Demolition Waste Management and Disposal
6. Section 01 78 00 – Closeout Submittals
7. Section 01 79 00 – Demonstration and Training
	1. **Reference Standards**
8. All referenced standards and recommended practices in this section pertain to the most recent publication thereof, including all addenda and errata.
9. ASHRAE 70 – Method of Testing the Performance of Air Outlets and Air Inlets
10. ASTM 610 – Standard Practice for Evaluating Degree of Rusting on Painted Steel Surfaces
11. ASTM 714 – Test Method for Evaluating Degree of Blistering of Paints
12. ASTM D1308 – Standard Test Method for Effect of Household Chemicals on Clear and Pigmented Organic Finishes
13. ASTM D1654 – Standard Test Method for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments
14. ASTM D4752 – Standard Practice for Measuring MEK Resistance of Ethyl Silicate (Inorganic) Zinc-Rich Primers by Solvent Rub
15. NFPA 90A – Standard for the Installation of Air-Conditioning and Ventilating Systems
16. UL/ULC – Underwriters Laboratories Fire Resistance Directory/Underwriters Laboratories of Canada Equipment and Materials Directory

**1.04 Submittals**

1. See Section 01 30 00 – Administrative Requirements for submittal procedures.
2. Product Data: Provide data indicating configuration, general assembly, and materials used in fabrication. Include catalog performance ratings that indicate airflow, static pressure, and NC designation.
3. Shop Drawings: Indicate configuration, general assembly, and materials used in fabrication.
4. Project Record Documents: Record actual locations of units and control components.
5. Operation and Maintenance Data: Include manufacturer's descriptive literature, operating instructions (if applicable), and maintenance and repair data.
6. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.
7. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
	1. See Section 01 60 00 - Product Requirements for additional provisions.

**1.06 Quality Assurance**

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

**1.07 Warranty**

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

**PART 2 – PRODUCTS**

**2.01 Manufacturer**

1. Basis of Design: Price Industries, Inc.
2. Square Plaque Diffusers: Models SPD, SPDAS, ASPD
3. Fire-Rated Square Plaque Diffusers: Model SPD-FR
4. High Induction Square Plaque Diffusers: Model SPDHI
5. Low Temperature Square Plaque Diffusers: Model SPDLT, ASPDLT
6. General:
	1. The square plaque diffuser shall be supplied to deliver a 360 degree radial, horizontal air flow pattern. The back cone shall be a one-piece die-formed design 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 Plaque Diffusers**

1. Description:
	1. Furnish and install Price model [SPD – steel], [SPDAS – aluminized steel] or [ASPD – aluminum] square plaque ceiling diffusers of sizes and mounting types designated by the plans and air distribution schedule.
2. 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. An inner plaque assembly shall be incorporated and shall drop no more than ¼ inch below the ceiling plane to assure proper air distribution performance.
	3. The inner plaque assembly shall be completely removable from the room side to allow for full access to any dampers or other ductwork components located near the diffuser neck.
	4. The diffuser shall integrate with all duct sizes shown on the plans without affecting the face size and appearance of the unit.
	5. The face panel shall have smooth edges and rounded corners to blend with the back cone.
	6. The diffuser ceiling module size shall be (**select one**):
		1. 24 x 24 inches (600 x 600 millimeters)
		2. 20 x 20 inches (500 x 500 millimeters)
		3. 12 x 12 inches (300 x 300 millimeters)
3. Paint Specification:
	1. Paint finish shall be (**select one**):
		1. Baked-on powder coat finish.
			1. The paint film thickness shall be a minimum of 2 mils.
			2. The finish shall have a hardness of 2H as tested in accordance with ASTM D3363.
			3. The finish shall pass an ASTM B117 Corrosive Environment Salt Spray Test for 1000 hours with no measurable creep, rusting or blistering as per ASTM D1654, D610 and D714.
			4. The finish shall pass an ASTM D870 Water Immersion test of a minimum of 500 hours with no measurable with no rusting or blistering as per ASTM D610 and D714.
			5. The finish shall have an impact resistance of 100 inch-pounds in accordance with ASTM D2794.
		2. All components shall have a custom finish in a color to match a customer supplied sample.
4. Mounting Frame:
	1. The diffuser mounting frame shall be suitable for lay-in or surface mount applications with the following frame style (select one):
		1. Surface mount
		2. 15/16 inch wide flat T-bar
		3. 9/16 inch wide T-bar with drop frame
		4. 9/16 wide tegular T-bar
		5. Concealed spline
		6. Snap-in T-bar
		7. Clip-on Recessed Spline
5. Options (**select all that apply**):
	1. Insulated Back pan (**select one**):
		1. 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. (**for 20x20 and 500x500 module sizes only**)
		2. 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. (**for 12x12, 24x24 and 600x600 module sizes only**)
	2. Steel Panel:
		1. The diffuser shall be mounted in a steel panel for lay-in applications.
		2. The panel size shall be based on the diffuser size selected.
			1. For 24 x 24 diffusers, the panel shall be (**select one**):
				1. 24 x 48
				2. 30 x 30
			2. For 12 x 12 diffusers, the panel shall be (**select one**):
				1. 12 x 24
				2. 12 x 48
				3. 20 x 20
				4. 24 x 24
	3. Beaded Extended Neck:
		1. The diffuser shall be supplied with a beaded neck extended to a depth of 2-1/2 inches.
	4. Damper:
		1. 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 ASPD only**):
		1. The diffuser shall be supplied with an all-aluminum construction for MRI applications.
		2. The diffuser module shall be 24 x 24 inches with a [T-bar] **or** [Narrow member] frame style.
		3. The MRI option does not include a volume control damper.

**2.03 Fire-Rated Square Plaque Diffusers**

1. Description:
	1. Furnish and install Price model SCD-FR fire-rated square plaque 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.
2. Construction:
	1. Diffusers shall be steel construction, and shall consist of a seamless, one-piece, precision formed back cone with no corner joints 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 plaque assembly shall be incorporated and shall drop no more than ¼ inch below the ceiling plane to assure proper air distribution performance.
	4. The inner plaque assembly shall be completely removable from the room side to allow for full access to any dampers or other ductwork components located near the diffuser neck.
	5. The diffuser ceiling module size shall be (**select one**):
		1. 24 x 24 inches (600 x 600 millimeters)
		2. 20 x 20 inches (500 x 500 millimeters)
		3. 12 x 12 inches (300 x 300 millimeters)
3. Paint Specification:
	1. Paint finish shall be (**select one**):
		1. Baked-on powder coat finish.
			1. The paint film thickness shall be a minimum of 2 mils.
			2. The finish shall have a hardness of 2H as tested in accordance with ASTM D3363.
			3. The finish shall pass an ASTM B117 Corrosive Environment Salt Spray Test for 1000 hours with no measurable creep, rusting or blistering as per ASTM D1654, D610 and D714.
			4. The finish shall pass an ASTM D870 Water Immersion test of a minimum of 500 hours with no measurable with no rusting or blistering as per ASTM D610 and D714.
			5. The finish shall have an impact resistance of 100 inch-pounds in accordance with ASTM D2794.
		2. All components shall have a custom finish in a color to match a customer supplied sample.
4. Damper:
	1. The diffuser shall be supplied with a galvanized steel, non-adjustable, butterfly-type ceiling radiation damper.
5. Thermal Blanket:
	1. The diffuser shall be externally wrapped with a non-asbestos thermal blanket.
6. Mounting Frame:
	1. The diffuser mounting frame shall be suitable for lay-in applications with the following frame style (select one):
		1. T-bar
		2. Panel Style T-bar
7. Options (**select all that apply**):
	1. Volume Control:
		1. The diffuser shall be supplied with a steel volume control damper that is room side adjustable with an allen key for balancing.
8. Fusible Link:
	1. The diffuser shall be supplied with a fusible link rated for (**select one**):
		1. 165 degrees Fahrenheit.
		2. 212 degrees Fahrenheit.

**2.04 High Induction Square Plaque Diffusers**

1. Description:
2. Furnish and install Price model SPDHI high induction square plaque ceiling diffusers of sizes and mounting types designated by the plans and air distribution schedule.
3. Construction:
	1. Diffusers shall be steel construction, and shall consist of a seamless, one-piece, precision formed back cone with no corner joints 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 plaque assembly shall be incorporated and shall drop no more than ¼ inch below the ceiling plane to assure proper air distribution performance.
	4. The inner plaque assembly shall be completely removable from the room side to allow for full access to any dampers or other ductwork components located near the diffuser neck.
	5. An engineered induction chamber with horizontal discharge nozzles shall be attached to the backpan and directly pressurized by the supply air inlet.
	6. The diffuser ceiling module size shall be (**select one**):
		1. 24 x 24 inches (600 x 600 millimeters)
		2. 20 x 20 inches (500 x 500 millimeters)
		3. 12 x 12 inches (300 x 300 millimeters)
4. Paint Specification:
	1. Paint finish shall be (**select one**):
		1. Baked-on powder coat finish.
			1. The paint film thickness shall be a minimum of 2 mils.
			2. The finish shall have a hardness of 2H as tested in accordance with ASTM D3363.
			3. The finish shall pass an ASTM B117 Corrosive Environment Salt Spray Test for 1000 hours with no measurable creep, rusting or blistering as per ASTM D1654, D610 and D714.
			4. The finish shall pass an ASTM D870 Water Immersion test of a minimum of 500 hours with no measurable with no rusting or blistering as per ASTM D610 and D714.
			5. The finish shall have an impact resistance of 100 inch-pounds in accordance with ASTM D2794.
		2. All components shall have a custom finish in a color to match a customer supplied sample.
5. Mounting Frame:
	1. The diffuser mounting frame shall be suitable for lay-in or surface mount applications.
6. Options (**select all that apply**):
	1. Insulated Back pan (**T-bar application only**):
		1. 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.
	2. Volume Control:
		1. The diffuser shall be supplied with a steel volume control damper that is room side adjustable with an allen key for balancing.

**2.05 Low Temperature Square Plaque Diffusers**

1. Description:
2. Furnish and install Price model [SPDLT] or [ASPDLT] low temperature square plaque ceiling diffusers of sizes and mounting types designated by the plans and air distribution schedule. Unit performance data shall be provided for throw and drop at 40 degrees Fahrenheit a supply temperature with a room temperature of 75 degrees Fahrenheit.
3. Construction:
	1. Diffusers shall be [steel], **or** [aluminum] construction, and shall consist of a seamless, one-piece, precision formed back cone with no corner joints 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 plaque assembly shall be incorporated and shall drop no more than ¼ inch below the ceiling plane to assure proper air distribution performance.
	4. The inner plaque assembly shall be completely removable from the room side to allow for full access to any dampers or other ductwork components located near the diffuser neck.
	5. The diffuser induction chamber shall project the supply air through multiple tapered discharge slots. The induction chamber shall be constructed of the same material as the diffuser assembly.
	6. The diffuser ceiling module size shall be (**select one**):
		1. 24 x 24 inches
		2. 20 x 20 inches
4. Paint Specification:
	1. Paint finish shall be (**select one**):
		1. Baked-on powder coat finish.
			1. The paint film thickness shall be a minimum of 2 mils.
			2. The finish shall have a hardness of 2H as tested in accordance with ASTM D3363.
			3. The finish shall pass an ASTM B117 Corrosive Environment Salt Spray Test for 1000 hours with no measurable creep, rusting or blistering as per ASTM D1654, D610 and D714.
			4. The finish shall pass an ASTM D870 Water Immersion test of a minimum of 500 hours with no measurable with no rusting or blistering as per ASTM D610 and D714.
			5. The finish shall have an impact resistance of 100 inch-pounds in accordance with ASTM D2794.
		2. All components shall have a custom finish in a color to match a customer supplied sample.
5. Insulation:
	1. The diffuser back pan shall be factory insulated with ¾ inch foil face insulation which meets the requirements of UL 181 and NFPA 90A. All seams and joints shall be sealed with coated cloth tape.
	2. The induction chamber shall be internally lined with ½ inch foil face insulation which meets the requirements of UL 181 and NFPA 90A.
	3. The upstream side of the inner plaque assembly shall be thermally lined with polyurethane foam insulation. The unit shall be designed and verified by test to prevent condensation from forming on the surface of the unit at 40 degrees Fahrenheit supply temperature and ceiling plenum conditions of 78 degrees Fahrenheit and 60 percent relative humidity. Units shall be tested in accordance with ASHRAE 70.
6. Mounting Frame:
	1. The diffuser mounting frame shall be suitable for lay-in or surface mount applications.

**PART 3 – EXECUTION**

**3.01 Examination**

1. Verify that conditions are suitable for installation.
2. Verify that field measurements are as shown on the drawings.

**3.02 Installation**

1. Install in accordance with manufacturer’s instructions.
2. See drawings for the size(s) and locations of diffusers.

**3.03 Field Quality Control**

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

**3.05 Cleaning**

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

**3.06 Closeout Activities**

1. See Section 01 78 00 – Closeout Submittals for closeout documentation requirements.
2. See Section 01 79 00 – Demonstration and Training for additional requirements.