

# Suggested Specifications

## Price Ultrasuite – Hospital OR Laminar Diffuser System with Integrated Lighting

*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. Hospital OR Laminar flow diffuser system with integrated LED lighting

#### **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. AAMA Standard 611-98 – Voluntary Specification for Anodized Architectural Aluminum; 1998
- B. ASHRAE Standard 62.1 – Ventilation for Acceptable Indoor Air Quality; 2016
- C. ASHRAE Standard 170 – Ventilation of Health Care Facilities; 2008
- D. ASTM D1308 – Standard Test Method for Effect of Household Chemicals on Clear and Pigmented Organic Finishes; 2013
- E. ASTM D4752 – Standard Practice for Measuring MEK Resistance of Ethyl Silicate (Inorganic) Zinc-Rich Primers by Solvent Rub; 2015
- F. ASTM C636 – Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels; 2013
- G. FGI Guideline 2010 – Facility Guidelines Institute, Guidelines for Design and Construction of Health Care Facilities; 2010
- H. UL1598 – Air-Handling Luminaries
- I. UL 2043 – Fire Test for Heat and Visible Smoke Release for Discrete Products and Their Accessories Installed in Air-Handling Spaces
- J. UL2108 – Low Voltage Lighting System
- K. UL8750 – Light Emitting Diode (LED) Equipment for Use in Lighting Products
- L. UL1310 – Class 2 Power Units
- M. UL94 – Flammability of Plastic Materials for Parts in Devices and Appliances
- N. IP67 – Ingress Protection Against Dust and Liquids
- O. OSP-0627-10 – OSHPD Special Seismic Certification Preapproval (Optional)

#### **1.04 Administrative Requirements**

- A. Pre-installation Meeting: Conduct a pre-installation meeting one week prior to the start of the work of this section; require attendance by all affected installers.
- B. Sequencing: Ensure that utility connections are achieved in an orderly and efficient manner.

#### **1.05 Submittals**

- A. See Section 01 30 00 – Administrative Requirements for submittal procedures.
- B. Product Data: Provide data indicating configuration, photometric, general assembly, and materials used in fabrication.
- C. Shop Drawings: Indicate configuration, general assembly, and materials used in fabrication.
- D. Manufacturer's Installation Instructions: Indicate support and hanging details, installation instructions, recommendations, and service clearances required.
- E. Operation and Maintenance Data: Include manufacturer's descriptive literature, operating instructions, maintenance and repair data, and parts lists.
- 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. See Section 01 60 00 - Product Requirements for additional provisions.

#### **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.
- B. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

#### **1.07 Warranty**

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

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- C. Price Industries warrants that, at the time of shipment, the USA will be free from defects arising from manufacturing, workmanship, or a failure to adhere to Price Industries' published catalog specifications and specified material. If Price Industries is notified in writing of any such defect within the following specified warranty periods, Price Industries will, at its sole option, repair, replace, or refund the purchase price paid by the Representative for the Product:
- LED: (7) years from the date of shipment
  - Driver: (5) years from the date of shipment
  - All other components and hardware: (1) year from the date of shipment

Such remedies are the exclusive remedies available under this warranty.

## PART 2 – PRODUCTS

### 2.01 Hospital OR Laminar Flow Diffuser System with Integrated LED Lighting

- A. Basis of Design: Price Industries, Inc.
1. Hospital OR Laminar Flow Diffuser System with Integrated LED Lighting
- B. General:
1. The integrated plenum ceiling system shall incorporate laminar flow diffusers, integrated high performance LED lighting and a common plenum all into a single modular assembly design, to act as a single large diffuser array. The common pressurized plenum design results in fewer inlet connections, and reduced plenum height.
  2. All components of the integrated ceiling system shall be from a single manufacturer and shall be in accordance with ASHRAE Standard 170 and FGI 2010.
- C. Hospital OR Laminar Flow Diffuser System with Integrated LED Lighting: [Price Model USA]:
1. System Construction:
    - a. The integrated plenum shall incorporate laminar flow diffusers, providing non-aspirating, unidirectional airflow above the sterile zone, complete with room side adjustable aperture plate dampers with locking mechanism.
    - b. System shall include integrated LED lighting and certified to meet UL1598/CSA 22.2 No. 250.0 standard for air-handling luminaire.
    - c. Laminar diffuser face frame shall be made of extruded aluminum frame with welded miter corners and secured with four (4) quarter-turn fasteners with anti-slip, snap-in retainers and stainless steel retainer cables for ease of installation and removal.
    - d. Laminar diffuser face shall be composed of 1/8" thick fire-resistant engineered polymer with 13% free area. Perforated face area shall be at least 82% of nominal square footage for each diffuser.
    - e. The integrated plenum shall be provided with 14 gauge aluminum construction and fully welded vertical seams
    - f. Laminar modules will come [with] or [without] HEPA filters with gel seal, providing non-aspirating, unidirectional airflow above the sterile zone.
    - g. Each integrated plenum diffuser module shall include four (4) eye bolts for hanger wire support or (4) brackets for bracing and support for seismically compatible install.
    - h. The integrated plenum inlet collars shall be sized based on airflow requirements for the intended space.
    - i. Modules shall be factory assembled up to 48 inches x 120 inches for attachment to additional modules in the field by others.
  2. Integrated Lighting:
    - a. Each laminar diffuser module shall include integrated LED lighting, mounted so as to not interfere with the airflow of the system. LED strip lights and fluorescent tubes directly in the airflow path are not acceptable.
    - b. The entire perforated face of the laminar diffuser shall be fully equalized with light. Separate LED channels separating laminar diffusers or embedded into the diffuser frames are not acceptable.
    - c. Each laminar diffuser module shall either have two or three rows of LEDs installed around the internal perimeter of the diffuser module.
    - d. LED lighting shall have an efficiency greater than 80 lumens per watt, and lighting power shall be equivalent to 32 watts per meter for individual LED strip lighting.
    - e. LED lighting shall be IP67 rated and not susceptible to dust and liquid cleaning agents.
    - f. LED lighting shall have a nominal Color Correlation Temperature (CCT) of 4000K or 5000K. Optional green lighting available upon request.
    - g. LED lighting shall achieve Color Rendering Index (CRI) of either 85+ or 95+
    - h. LED lighting shall be rated for L80/B10 > 60,000 hours based on LM-80 testing.
    - i. LED lighting shall be certified to meet UL2108 and meet fire/smoke ratings of UL2043.
    - j. Photometric IES files, achieved with a type-C Goniometer, shall be available to validate lighting performance.
    - k. LED lighting shall be paired with drivers supplied from the integrated laminar flow diffuser assembly manufacturer. Driver shall be capable of either 1% or 10% dimming, and PWM dimming shall meet IEEE1789. Optional 0.1% dimming available upon request.
    - l. LED driver shall comply with UL8750/CSA 22.2 No. 223-M91.
    - m. LED driver shall achieve Total Harmonic Distortion (THD) < 20% at maximum power.

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3. Paint finish (**select one**):
  - a. The ceiling system finish shall have a [B12 or B25] white baked-on powder coat finish matching the laminar flow diffusers and fill-in panels.
    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 1000 hours.
    5. The finish shall have an impact resistance of 80 in-lb.

## 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. Verification of the ceiling rough opening dimensions and all mechanical and electrical work by the installing contractor shall be completed prior to installation of the integrated ceiling system.
- B. Install the ceiling system components in accordance with manufacturer's instructions, and per ASTM C636.
- C. See drawings for the size(s) and locations of heavy duty cleanroom ceiling system.
- D. Do not support components from ductwork.

### 3.03 Adjusting

- A. Verify that field measurements are as shown on the drawings.

### 3.04 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.