Specifications for Architects, Engineers and Specifiers

Arithmetic Design, Inc.

DIFFUSE acoustic diffusion panels:

Foam Class A Fire Rated

Section 09 84 16

*NOTE TO ARCHITECT: This guide specification was prepared by Arithmetic Design, Inc. in accordance with CSI standards and formats. This section includes specification for DIFFUSE acoustic diffusion panels and appropriate mounting practice. This section must be carefully examined, reviewed and edited by the Architect to meet project requirements and local building codes. Coordinate this section with other specification sections and project drawings.*

*NOTE TO SPECIFIER: This section covers Arithmetic Design DIFFUSE acoustic panels in ASTM E 84 Class A fire rated foam. These DIFFUSE panels are different from DIFFUSE laminate and DIFFUSE Baltic Birch premium panels. Please contact Arithmetic Design for information regarding DIFFUSE products other than fire rated foam DIFFUSE panels outlined in this section.*

*NOTE TO SPECIFIER: This section should be modified to suit project requirements. Modify or add items as necessary. Delete items which are not applicable. Words and sentences within* ***bold brackets [\_\_\_\_ ]*** *reflect a choice to be made with regard to an item or statement. Please contact Arithmetic Design for updates and revisions to this section.*

**PART 1: GENERAL**

 1.01 SECTION INCLUDES

 A. DIFFUSE acoustic diffusion panels

 B. Coordination of trades associated with installation and implementation of wood panels described in this section.

 1.02 ALTERNATES

 A. Proposed substitutions for products in this section must be submitted to acoustic consultant and architect. Submissions for substitutions must be in accordance with due dates determined by General Contractor. Substitutions shall only be considered when appropriate acoustic data and tangible sample showing design, composition and finish.

 1.03 RELATED SECTIONS

 A. 09 84 14 - Acoustic Stretched-Fabric Wall System

 B. 09 51 23 - Acoustical Tile Ceilings

 1.04 REFERENCES

(Note to Specifier: modify section as necessary.)

 A. Local Building Code - Current Edition

 B. ASTM: E 84 - Surface burning characteristics of building materials - standard testing method.

 C. UL 94 - Standard of safety of flammability of plastic parts in devices and appliances testing.

 C. ISO 17497-1 - Sound scattering performance and sound scattering coefficients in a reverberation room.

 1.05 DESIGN REQUIREMENTS

(Note to Specifier: modify section as necessary.)

 A. Provide full spectrum sound scattering with a single acoustic product.

 B. Provide thin profile (<1" depth) full spectrum sound scattering with a single product not measuring more than 1" from wall surface.

 C. Provide an acoustical scattering surface with foam finish.

 1.07 PERFORMANCE REQUIREMENTS

(Note to Specifier: modify section as necessary.)

 A. Provide an acoustic diffuser system with fire rating

 1. ASTM E 84 Class A

 2. UL 94 HF - 1

 B. Sound scattering

 C. Acoustic number theory Aperture Grating wall panels with sound scattering to meet minimum requirements when tested in accordance with ISO 17497-1 standards.

 1.06 SUBMITTALS

 A. Submit in accordance with provisions of Section 01300

 B. Product Data: Submit manufacturers installation instructions and technical data including descriptions and sizes certifying conformance with specified performance requirements. Include pertinent size, spacing and dimensional data.

 C. Shop drawings: Submit shop drawings of products, mountings and installation instructions. Show details of interior renderings including dimensions, orientation and location of any element that may interfere with the installation and integration. Indicate standoff lengths of individual panels. Indicate hole patterns and panel spacing requirements on shop drawings. Verify site dimensional accuracy per shop drawings.

 D. Samples: Submit individual product sample including standoffs demonstrating fire rating, size, composition and specified finish.

 1.07 QUALITY ASSURANCE

 A. Produce Source: Products under this section shall be supplied from a single manufacturer to ensure consistency of performance, size and finish.

 B. Installer Qualifications: Installer shall have prior experience in working with similar products including handling, receiving and inspecting similar products with verified minimum experience of (2) years.

 1.08 DELIVERY, STORAGE AND HANDLING

 A. Delivery and Receiving: Products shall be delivered and received in manufacturers original and unopened packaging. Packaging shall be inspected for damage and proper conditions. Damage shall be reported to superintendent, carrier or manufacturer. Carrier must be notified of unsatisfactory product conditions upon receipt if damage is present. Products shall not be unpackaged until required environment and site conditions are present for installation.

 B. Storage: Products shall be stored in a clean, dry and enclosed facility.

 C. Acceptance and Installation: Partial or full installation denotes full acceptance of product delivery.

 D. Disposal and Waste: All packaging, waste and refuse shall be disposed of in a responsible manner in accordance with General Contractors policies and procedures and/or as site facilities allow. When disposing of materials, consider recycling when provided on site. All disposal must be in accordance with local ordinance and in accordance with applicable regulating bodies.

 E. Environmental: Installation of products shall not commence until building and site has been appropriately enclosed and acceptable interior environment conditions exist.

**PART 2: PRODUCTS**

 2.01 MANUFACTURER

 A. Arithmetic Design, Inc., P.O. Box 11074, Denver, CO 80211, (720) 255-1604; www.arithmetic-design.com

B. Substitutions and alternates must be approved as noted above or in accordance with General Contractor's addendum.

 2.02 MATERIALS

 A. NBR/PVC Foam 3/8" laminated with backing strips

 1. ASTM Class A flame spread and smoke production

 2. UL 94 HF - 1 flammability rating

 B. Designer/Architect specified finish.

 2.03 MANUFACTURED UNITS

(Note to Specifier: modify section as necessary.)

 A. Sizes specification

 1. **[2' height x 2' width x 7/8" depth (nominal)]**

 2. **[2' height x 4' width x 7/8" depth (nominal)]**

3. **[2' height x 2' width x 1.5" depth (nominal)]**

 4. **[2' height x 4' width x 1.5" depth (nominal)]**

 B. Finished unit dimensions (as manufactured)

 1. **[(2' x 2' x 3/4") - 23.625" x 23.625" x 3/4"]**

 2. **[(2' x 4' x 3/4") - 23.625" x 47.625" x 3/4"]**

3. **[(2' x 2' x 1.5") - 23.625" x 23.625" x 1.5"]**

 4. **[(2' x 4' x 1.5") - 23.625" x 47.625" x 1.5"]**

 C. Standoff strip distance (standard)

 1. **[(1.5" depth panel) - 1/4" overall standoff from wall surface]**

 2. **[(1" depth panel) - 1/2" overall standoff from wall surface]**

 2.04 MOUNTING

(Note to Specifier: modify section as necessary.)

 A. Standoff strip distance - rear air gap specification

 1. **[(2' x 2' x 1") - 1/4" standard rear air gap]**

 2. **[(2' x 4' x 1") - 1/4" standard rear air gap]**

 3. **[(2' x 2' x 1.5") - 1/2" standard rear air gap]**

 4. [**(2' x 4' x 1/5") - 1/2" standard rear air gap]**

**PART 3: EXECUTION**

 3.01 EXAMINATION

 A. Examine products in this section for manufacturer specified sizes and finish. Do not proceed with product installation until satisfactory working conditions are present. If satisfactory conditions do not exist, do not proceed until the conditions have been rectified. Mounting surfaces should be flat, smooth and dry. Appropriate anchor shall be determined by installer to support load of product weight under specified conditions.

 3.02 PREPARATION

 A. Measure and confirm specifications per shop drawing for installation area. Do not install if verification is negative.

 B. Unpack all DIFFUSE panels and inspect.

 C. When more than one panel is adjacent, mock up panel array to ensure fit and finish.

 D. Ensure all panels are present.

 3.03 CONSTRUCTION

 A. Coordination with other trades

 1. Adjust panels as indicated on shop drawings to interface with all electrical apparatus, including outlets, light fixtures and signage, HVAC system components, speakers, fire suppression systems including sprinklers, switches, controls and piping, and other trade obstructions. Obstructions listed are for reference and are not limited to above.

 2. DIFFUSE panels shall, in no circumstance, support the weight or interface of any other construction.

 3.03 INSTALLATION

(Note to Specifier: modify section as necessary.)

 A. Install panels according to architectural and shop drawings in accordance with manufacturer instructions. Use appropriate mounting and anchoring.

 B. **[Wall mount installation]**

 1. Apply standard construction adhesive to the backing strips for mounting

 a. Apply adhesive directly to the backing strips

 b. Apply adhesive to the full length of the backing strips

 c. Do not use alcohol based adhesives. These adhesives will eat away at the panel material.

 2. Mount panel

 a. Place panel on wall or substrate in accordance with adhesive manufacturer's instructions.

 b. Insert appropriate length screw into mounting holes on foam panels.

 c. Drive screw into substrate material

 d. NOTE: The screws are used only to hold the panel in place as the adhesive sets. The adhesive wil hold the panel in place permanently. Screws may remain for additional mounting strength if desired by contractor. This is most common.

 C. **[Ceiling panel installation]**

 1. Refer to suspended appropriate ceiling assemblies section to ensure suspension system is installed properly before installing DIFFUSE ceiling tiles.

 2. Ensure drop ceiling framework in intact and secure according to appropriate section requirements.

 3. Insert panel through bottom of ceiling frame at a diagonal to ceiling frame rails so that entire DIFFUSE panel is above ceiling frame rails.

 4. Carefully lower panel into place so that entire DIFFUSE panel is resting securely on ceiling frame rails.

 5. Adjust panels as necessary.

 3.04 ADJUSTMENT

(Note to Specifier: modify section as necessary.)

 A. **[Wall mount adjustment]**

 1. Any adjustments made should be done before adhesive has set.

 2. If adhesive has set and adjustments need to be made, DIFFUSE panel should be removed from wall or substrate.

 a. Remove panel from wall by pulling behind air gap on edges of panel

 b. Remove excess debris from panel and adhesive from wall with a scrapper.

 c. Removed panel should be discarded and a replacement ordered from Listen Audio Systems, Inc.

 3. Once adhesive has set, panels should not be adjusted.

 B. **[Ceiling panel adjustment]**

 1. Adjust ceiling panels by hand to ensure proper fit and finish.

 3.05 CLEANING

 A. Clean debris from installation from work site in an appropriate manner.

 B. Vacuum dust and debris from panels with a soft brush attachment..

 C. Additional cleaning should be accomplished with a damp cloth.

 D. Remove all debris caused by this section from work site upon completion of installation. Crates, packaging, and associated waste and debris shall be properly disposed of.

 E. Recycle materials when possible.

END OF SECTION