

SECTION 09 54 00 SPECIALTY CEILINGS

Gulfstream Acoustic PET Felt Ceiling Tile System

12 mm PET Acoustic Felt - Dimensional Lay-In Ceiling Tile

Specifier Note: This Section is written as a manufacturer's guide specification (an architectural standard) for editing into a project manual. It follows the CSI three-part SectionFormat and PageFormat. Text in brackets [] indicates a choice or value to be selected or inserted by the design professional; delete brackets and unused options. Blank lines [] indicate project-specific data to be supplied. Coordinate this Section with Division 01, with the Drawings, and with related Sections before issue. Renummer to a project-specific number (for example, 09 54 13) if required by the project manual.

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes acoustic PET felt specialty ceiling tiles with an integral dimensional perimeter box, for lay-in installation in an exposed-tee ceiling suspension grid.
- B. Related Requirements:

Specifier Note: Retain or revise the Related Requirements paragraphs below to identify Sections that contain coordinating requirements. Delete those not applicable to the Project.

- 1. Section 09 51 13 "Acoustical Panel Ceilings" and Section 09 53 00 "Acoustical Ceiling Suspension Assemblies" for the metal suspension system into which tiles of this Section are installed.
- 2. Section 09 84 13 "Sound-Absorptive Panels" for acoustic wall panels of similar material.
- 3. Division 26 Sections for light fixtures installed in or coordinated with the ceiling.
- 4. Division 23 Sections for air outlets and inlets installed in the ceiling.
- 5. Division 21 Sections for fire-suppression piping and sprinklers penetrating the ceiling.

1.2 REFERENCE STANDARDS

Specifier Note: Retain only the standards that remain referenced in the edited Section. Verify dates and titles against current editions.

- A. ASTM International (ASTM):
 - 1. ASTM C635/C635M - Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-In Panel Ceilings.
 - 2. ASTM C636/C636M - Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels.
 - 3. ASTM E84 - Surface Burning Characteristics of Building Materials.
 - 4. ASTM E580/E580M - Installation of Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels in Areas Subject to Earthquake Ground Motions.
 - 5. ASTM E1264 - Classification for Acoustical Ceiling Products.
- B. International Organization for Standardization (ISO):
 - 1. ISO 354 - Acoustics - Measurement of Sound Absorption in a Reverberation Room.
 - 2. ISO 9001 - Quality Management Systems - Requirements.
 - 3. ISO 11654 - Acoustics - Sound Absorbers for Use in Buildings - Rating of Sound Absorption.
 - 4. ISO 14025 - Environmental Labels and Declarations - Type III Environmental Declarations.
- C. Additional References:
 - 1. EN 13501-1 - Fire Classification of Construction Products and Building Elements - Part 1.

2. EN 12667 - Thermal Performance of Building Materials and Products - Determination of Thermal Resistance.
3. BS 476-7 - Fire Tests on Building Materials and Structures - Surface Spread of Flame.
4. OEKO-TEX Standard 100 - Testing for Harmful Substances.
5. Global Recycled Standard (GRS) - Textile Exchange.
6. Global GreenTag International - GreenRate and Product Health Declaration (PhD) Certification Programs.
7. Cisca - Ceiling & Interior Systems Construction Association: Ceiling Systems Handbook.
8. ICC - International Code Council: International Building Code (IBC).

1.3 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Conference: Conduct a conference at [the Project site] to review installation procedures, coordination with related work, ambient conditions, and the approved layout.
- B. Coordination: Coordinate ceiling tile layout, custom sizes, and box profile with the suspension system, light fixtures, air outlets, sprinkler heads, and other ceiling-mounted items. Furnish layout information required by other trades.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include construction details, material descriptions, component dimensions and profiles, finishes, fire-test-response characteristics, and acoustic performance data.
- B. Shop Drawings: Show the following:
 1. Reflected ceiling plan, drawn to scale, with tile layout, module dimensions, and coordination with the suspension grid.
 2. Tile types, custom sizes, box depth, box plan dimensions, and box profile or shape.
 3. Edge and perimeter conditions, junctions with adjoining construction, and changes in ceiling height.
 4. Locations of and details at penetrations, light fixtures, air outlets, sprinklers, and other items.
 5. Method of joining the louvers and engaging the arrowhead locks, and the assembly sequence for deep-profile tiles.
- C. Samples for Initial Selection: Manufacturer's color charts showing the full range of standard PET felt colors (refer to the manufacturer's current color offering at airspaceacoustics.com/colors), with information on custom color and custom print capability.
- D. Samples for Verification: For each type, color, and finish of ceiling tile:
 1. [Full-size tile] [Representative tile section not less than 12 by 12 inches], including a section of the perimeter box and an arrowhead lock.
 2. Custom color or custom print samples where custom finishes are specified.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For [manufacturer] [and] [Installer], including documentation that the manufacturer's quality management system is registered to ISO 9001.
- B. Product Test Reports: Based on tests by a qualified testing agency, for:
 1. Surface-burning characteristics (ASTM E84).
 2. Fire classification (EN 13501-1 and BS 476-7), where required by the Project.
 3. Sound absorption (ISO 354) and sound absorption rating (ISO 11654).
 4. Thermal performance (EN 12667), where required by the Project.
- C. Sustainable Design Submittals:

Specifier Note: Retain the subparagraphs below for Projects pursuing green building certification; otherwise delete. The Global GreenTag PhD PlatinumHEALTH declaration supports WELL and LEED human-health credits.

1. Documentation of recycled content, indicating the percentage of post-consumer recycled content.
2. Global Recycled Standard (GRS) certification.
3. Environmental Product Declaration (EPD), third-party verified in accordance with ISO 14025.
4. Global GreenTag GreenRate Level A certificate and Global GreenTag PhD PlatinumHEALTH declaration.
5. OEKO-TEX Standard 100 certificate.
6. Documentation that products contain no added formaldehyde binders.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Data: Manufacturer's care, cleaning, and maintenance instructions, for inclusion in the operation and maintenance manual.
- B. Warranty: Sample of the special warranty specified in this Section.

1.7 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed, packaged with protective covering for storage and identified with labels describing contents:
 1. Ceiling Tiles: Full-size units equal to [2] percent of the quantity installed for each type, color, and finish, but no fewer than 4 units.

1.8 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A firm experienced in manufacturing products similar to those indicated, with a record of successful in-service performance, a quality management system registered to ISO 9001, and the capability to provide custom fabrication of size, color, and box profile.
- B. Installer Qualifications: An entity acceptable to the manufacturer for installation of products similar in material, design, and extent to those indicated for this Project.
- C. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and qualities of materials and execution.
 1. Build mockup of [a minimum area of 6 by 6 tiles] [one full ceiling bay], including a perimeter condition and a typical penetration.
 2. Approved mockups may become part of the completed Work if undisturbed at the time of Substantial Completion.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products in the manufacturer's original, unopened packaging with labels intact.
- B. Store materials flat, indoors, in a fully enclosed, dry, and conditioned space, protected from moisture, soiling, direct sunlight, and physical damage.
- C. Handle ceiling tiles to prevent crushing, creasing, soiling, and edge damage.

1.10 FIELD CONDITIONS

- A. Environmental Limitations: Do not install ceiling tiles until spaces are enclosed and weatherproof, wet-work in spaces is complete and dry, work above the ceiling is complete, and ambient conditions are maintained at the values planned for building occupants.
- B. Acclimatize ceiling tiles in the installation areas for not less than 48 hours before installation.

1.11 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which the manufacturer agrees to repair or replace components that fail in materials or workmanship within the warranty period.
 1. Warranty Period: 10 years from the date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis-of-Design Product: The design is based on the **Gulfstream Acoustic PET Felt Ceiling Tile System** by Air[]Space Acoustics, Inc., 1515 Central Avenue, Chattanooga, TN 37408; airspaceacoustics.com. Subject to compliance with the requirements of this Section, provide the named product.
- B. Source Limitations: Obtain ceiling tiles and accessories from a single manufacturer.
- C. Manufacturer Quality System: The manufacturer's quality management system shall be registered to ISO 9001.
- D. Substitutions: [Comparable products will be considered] [No substitutions will be permitted] in accordance with Division 01 requirements.

2.2 ACOUSTIC PET FELT CEILING TILE SYSTEM

- A. System Description: A dimensional, lay-in acoustic ceiling tile fabricated from PET acoustic felt, consisting of a felt face panel and an integral perimeter box formed by interlocking felt louvers retained by die-cut arrowhead locks, installed in an exposed-tee suspension grid specified in [Section 09 53 00].
- B. Assembly of the perimeter box requires no adhesive and no mechanical fasteners; the louvers are retained by integral, die-cut arrowhead locks.

2.3 PERFORMANCE REQUIREMENTS

- A. Surface-Burning Characteristics: Provide ceiling tiles with the following surface-burning characteristics, as determined by testing identical products per ASTM E84 by a qualified testing agency:
 - 1. Classification: Class A.
 - 2. Flame-Spread Index: 25 or less.
 - 3. Smoke-Developed Index: 450 or less.
- B. Additional Fire Classifications, where required by the Project:
 - 1. EN 13501-1: Class B-s1,d0.
 - 2. BS 476-7: Class 1 (surface spread of flame).
- C. Acoustic Performance: Provide ceiling tiles with sound-absorption performance not less than the following, when tested per ISO 354:

Specifier Note: The dimensional perimeter box creates a captured air cavity behind the felt face, which raises sound absorption relative to a flat, directly mounted panel. Select the NRC value that corresponds to the installed box depth and air cavity, and coordinate with the Project acoustician.

- 1. Noise Reduction Coefficient (NRC), single layer, direct mount: 0.55.
 - 2. NRC, with a nominal 1/2-inch air cavity behind the tile: 0.85.
 - 3. NRC, dense configuration with a trapped air cavity: up to 1.25.
 - 4. Sound Absorption Class: Class D per ISO 11654, with a weighted sound absorption coefficient (alpha-w) in the range of 0.25 to 0.55 depending on installed configuration and box depth.
 - D. Thermal Performance: The 12 mm PET felt has an estimated thermal resistance of approximately R-1.5 (estimated range R-1.25 to R-1.80), expressed in hr-sq ft-deg F/Btu. Where a rated value is required, provide thermal resistance tested in accordance with EN 12667.
- Specifier Note:** The R-value above is an estimate derived from felt thickness and density. Insert the manufacturer's EN 12667 tested thermal resistance where the Project requires a rated value.
- E. Recycled Content: Minimum 60 percent post-consumer recycled PET fiber content; product is 100 percent recyclable and certified to the Global Recycled Standard (GRS).
 - F. Environmental and Health Declarations: Provide products supported by the following third-party documentation:
 - 1. Environmental Product Declaration (EPD), third-party verified in accordance with ISO 14025.

2. Global GreenTag GreenRate Level A certification, recognized for Green Star Responsible Products credits.
3. Global GreenTag PhD PlatinumHEALTH certification, verifying ingredient transparency and compliance with WELL and LEED human-health requirements.
4. OEKO-TEX Standard 100 certification (tested for harmful substances).

2.4 MATERIALS

A. PET Acoustic Felt:

1. Composition: 100 percent polyester (PET) fiber, consisting of minimum 60 percent post-consumer recycled PET fiber (derived from recycled PET bottles) with the balance virgin PET fiber; non-woven; 100 percent recyclable.
2. Nominal Thickness: 12 mm (approximately 1/2 inch), plus or minus 5 percent.
3. Areal Density: Approximately 2,400 grams per square meter (5.29 pounds per square meter).
4. Raw Sheet Size: 48 by 96 inches, plus or minus 1 inch.
5. Sheet Weight: 15.74 pounds per 48-by-96-inch sheet.
6. Surface: Non-woven, with no directional pattern or nap. Minor variation in thickness, surface texture, and color, and occasional superficial spots, are inherent to PET felt; batch-to-batch color variation may occur.
7. Fire-Retardant Properties: Inherent and permanent to the PET FR fiber; no topically applied or chemical fire-retardant treatment.
8. Content: Free of formaldehyde binders and chemical irritants; free of added odors.

Specifier Note: Areal density and sheet weight above are stated for nominal 12 mm PET felt. PET felt density carries a manufacturing tolerance of plus or minus 5 percent; confirm against the production lot.

B. Color and Finish:

1. Standard Colors: As selected by the Architect from the manufacturer's standard range of PET felt colors; refer to the manufacturer's current color offering at airspaceacoustics.com/colors.
2. Custom Color or Print: [Provide custom color] [Provide custom printed finish] as indicated on the Drawings; [_____].

Specifier Note: No color has been preselected for this Project; indicate the selected color(s) and any custom finishes on the Drawings or in a finish schedule. PET felt color is non-directional; no pattern matching between tiles is required.

2.5 CEILING TILE FABRICATION

A. General: Factory-fabricate tiles by cutting PET felt face panels and perimeter louvers from raw sheets and forming the dimensional perimeter box.

B. Tile Face Panel:

1. Standard Size: 23-3/4 by 23-3/4 inches, for a nominal 24-by-24-inch suspension grid module.
2. Custom Size: As indicated on the Drawings; [_____].

C. Perimeter Box:

1. Configuration: Formed by four PET felt louvers set in 2 inches from the perimeter edge of the tile face, joined and retained by die-cut arrowhead locks integral to the felt; no adhesive, no mechanical fasteners, and no separate base panel or other attached component.
2. Standard Box Depth: 3 inches.
3. Standard Louver: Developed (flat) width of approximately 19.277 inches.
4. Customization: Box depth, plan dimension, and profile or shape are customizable. [Provide a box depth of _____ inches] [Provide the box configuration indicated on the Drawings].

D. Tile Weight: Approximately 2.7 pounds (1.2 kg) per standard tile, consisting of the 23-3/4-inch felt face panel and four louvers at a 3-inch box depth. The weight of custom tiles varies with face size and box depth; calculate weight as the felt areal density multiplied by the total developed felt area (face panel plus the four louvers).

2.6 SUSPENSION SYSTEM

Specifier Note: Gulfstream tiles install into a standard exposed-tee suspension grid specified in another Section. Retain and edit the tee face width below to match the Project.

- A. Metal Suspension System: Furnished and installed under [Section 09 53 00 "Acoustical Ceiling Suspension Assemblies"] [Section 09 51 13]; provide an exposed-tee grid complying with ASTM C635/C635M, of intermediate-duty or heavy-duty classification as required by the Project.
 - 1. Module: Nominal 24 by 24 inches.
 - 2. Exposed Tee Face Width: [15/16 inch - standard exposed tee] [9/16 inch - narrow / slimline exposed tee].
 - 3. Finish and Color: [____], coordinated with the ceiling tile color.
- B. Verify that the selected suspension grid is compatible with the depth and weight of the specified Gulfstream tiles.

2.7 ACCESSORIES

- A. Hold-Down / Retention Clips: [Not required] [Provide the manufacturer's recommended retention clips where required by the authorities having jurisdiction, in areas subject to seismic requirements per ASTM E580/E580M, or for deep-profile tiles].
- B. Trim and Edge Moldings: As specified for the suspension system; coordinate color and finish with the ceiling tiles.

2.8 SOURCE QUALITY CONTROL

- A. Before shipment, verify the color, print, dimensions, and box configuration of fabricated tiles against the approved Samples and Shop Drawings.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and conditions, with the Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Verify that the suspension system is installed complete, level within the tolerances of ASTM C636/C636M, and securely anchored.
- C. Verify that work above the ceiling - including mechanical, electrical, and fire-suppression work - is complete and tested.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Coordinate ceiling tile installation with the layout shown on the approved Shop Drawings and with ceiling-mounted items.
- B. Verify that tiles have been acclimatized in accordance with Part 1 of this Section.

3.3 INSTALLATION

- A. General: Install ceiling tiles in accordance with the manufacturer's written instructions and the approved Shop Drawings.
- B. Handle tiles with clean, dry hands or gloves to avoid soiling the felt.
- C. Standard-Depth Tiles (box depth of 3 inches or less): Install each assembled tile into the suspension grid by inserting it into the grid module from below.
- D. Deep-Profile Tiles (box depth greater than 3 inches):
 - 1. Position two louvers of the perimeter box and partially assemble the tile.
 - 2. Set the tile into the suspension grid module.

3. Engage ("pop") the arrowhead locks to seat the remaining louvers and complete the dimensional box after the tile is in the grid.
- E. Install tiles with consistent orientation; maintain uniform joints and box alignment across the ceiling. PET felt is non-directional, and no pattern matching between tiles is required.
- F. Cutting: Cut border and penetration tiles cleanly with a sharp blade, making neat, square cuts. Provide cut tiles at the perimeter and at penetrations for light fixtures, air outlets, sprinklers, and similar items.

3.4 FIELD QUALITY CONTROL

- A. Inspect installed tiles for alignment, level, secure seating in the grid, completed box assembly, and freedom from soiling and damage.

3.5 CLEANING

- A. Remove dust by occasional vacuuming or with compressed air.
- B. Remove stains with water; while the felt is still wet, dab the stain with a dry cloth. Do not rub, because rubbing can damage the material.
- C. For difficult stains, use a felt-appropriate cleaning product (such as the James Cleaning set) in accordance with the cleaning product manufacturer's instructions; test on an inconspicuous area first.
- D. Replace tiles that are damaged or that cannot be cleaned to match adjacent tiles.

3.6 PROTECTION

- A. Protect installed ceiling tiles from damage, soiling, and moisture until the date of Substantial Completion.

3.7 CEILING TILE SCHEDULE

Specifier Note: Complete the schedule below to identify each ceiling tile type, or delete it and indicate types on the Drawings.

- A. Ceiling Tile Type CT-1:
 1. Location: [_____].
 2. Face Size: [23-3/4 by 23-3/4 inches].
 3. Box Depth: [3 inches].
 4. Box Profile / Shape: [Standard square].
 5. Color / Finish: [_____].

END OF SECTION 09 54 00