**SECTION 09 54 50**

**THERMOFORMED CEILING PANELS AND TILES**

SPECIFICATION COORDINATION: All sections in [brackets] require you to enter relevant information or make a selection based on project requirements before issuing specification. Please refer to appropriate Ceilume product data page when making your selection. All data pages are available for download at ceilume.com. Turn on hidden text to view or print specifier notes. Text in red applies only to drop-out ceilings (0.013” thick styles only).

DRAWING COORDINATION: Show reflected ceiling plan and, if required, special details.

DESIGN AND TECHNICAL ASSISTANCE: Ceilume customer service is available Monday thru Friday, 8:00 am to 4:30 pm, Pacific. Visit ceilume.com, email pro@ceilume.com, or call 1-877-492-5605.

# PART 1 – GENERAL

## 1.1 SUMMARY

1. Section Includes:
	1. [Thermoformed ceiling panels [and suspension system]] (lay-in) If suspension system is existing or specified in another section, delete applicable clause and edit section accordingly.
	2. [Thermoformed ceiling tiles] (glue-up)
2. Related Requirements: Edit following as required, and coordinate with other sections.
	1. [Ceiling suspension system]
	2. [Fire sprinklers: Coordination with sprinklers [penetrating] [installed above] ceiling]
	3. [Lighting: Coordination with [recessed lights] [lights installed above ceiling] [\_\_\_\_\_\_\_\_\_\_]]

## 1.2 REFERENCES

1. American Society for Testing Materials (ASTM):
	1. ASTM C423 Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method
	2. ASTM C518 Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus
	3. ASTM C557 Adhesives for Fastening Gypsum Wallboard to Wood Framing
	4. ASTM C635 Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings
	5. ASTM C636 Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels
	6. ASTM C665 Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing
	7. ASTM C1304 Odor Emission of Thermal Insulation Materials
	8. ASTM C1338 Fungi Resistance of Insulation Materials and Facings
	9. ASTM E84 Surface Burning Characteristics of Building Materials
	10. ASTM E413 Classification for Rating Sound Insulation
	11. ASTM E1348 Standard Test Method for Transmittance and Color by Spectrophotometry Using Hemispherical Geometry
	12. ASTM E1477 Standard Test Method for Luminous Reflectance Factor of Acoustical Materials by Use of Integrating-Sphere Reflectometers
	13. ASTM G21 Resistance of Synthetic Polymeric Materials to Fungi
2. British Standards Institute (BSI) BS EN 13501-1 Fire classification of construction products and building elements - Classification using data from reaction to fire tests
3. California Department of Public Health (CDPH) Standard Method V1.2-2017 using an Office and Classroom Environment
4. FM Global (FM) FM Approval Standard 4651
5. International Building Code (IBC)
6. National Fire Protection Association (NFPA) NFPA 13 Standard for the Installation of Sprinkler Systems
7. UL Solutions (UL):
	1. UL 94 Standard for Safety of Flammability of Plastic Materials for Parts in Devices and Appliances
	2. UL 723 Test for Surface Burning Characteristics of Building Materials
	3. UL 723S Drop-Out Ceilings Installed Beneath Automatic Sprinklers
	4. UL 2818 GREENGUARD Certification Program for Chemical Emissions For Building Materials, Finishes And Furnishings
	5. UL 2821 UL GREENGUARD Certification Program Method for Measuring and Evaluating Chemical Emissions From Building Materials, Finishes and Furnishings
8. UL Solutions in Canada (ULC) CAN/ULC-S102-10 Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies

## 1.3 ADMINISTRATIVE REQUIREMENTS

1. Definitions: Definitions of “panel” and “tile” are based on ASTM E1264 Standard Classification for Acoustical Ceiling Products. Coordinate terminology used with other sections and drawings. Definition of “drop-out ceiling” is based on NFPA 13 Standard for the Installation of Sprinkler Systems.
	1. Ceiling Panel: Prefabricated ceiling element used with exposed suspension system
	2. Ceiling Tile: Prefabricated ceiling element used with adhesive bonding
	3. Drop-Out Ceiling: Suspended ceiling system installed below fire sprinklers; panels are heat-sensitive and fall from their setting when exposed to heat
2. Preinstallation Meetings: Hold meeting with ceiling installer, fire sprinkler installer, and other parties affected by drop-out ceiling installation. Review coordination and sequencing of work and installation instructions given in product evaluation reports.

## 1.4 SUBMITTALS

Coordinate submittals with Division 01 requirements. Submit following for each type of suspension system and ceiling element.

1. Submit:
	1. Manufacturer’s product data, installation instructions, and warranty
	2. Samples
	3. Evaluation reports
	4. Environmental certifications

## 1.5 MAINTENANCE MATERIAL SUBMITTALS

1. Extra Stock Materials: Submit [10] [\_\_\_\_\_\_\_\_\_\_] pieces of each type of ceiling element specified.

## 1.6 QUALITY ASSURANCE

* + 1. Mock-Ups: Mock-ups are not required for typical ceiling installations. The following can be used, if required, to demonstrate integration of ceiling with lighting, sprinklers, and/or other project conditions.
			1. [Provide [100] [\_\_\_\_\_\_\_\_\_\_] sq ft mock-up at location indicated by Architect showing [\_\_\_\_\_\_\_\_\_\_].]
			2. [Approved mock-up [may remain as part of completed construction] [shall be removed after ceiling installation is accepted].]

## 1.7 DELIVERY, STOARAGE, AND HANDLING

1. Comply with manufacturer’s instructions.
2. Store upright in a single layer (no stacking) in a cool, dry location out of direct sunlight.

## 1.8 WARRANTY

1. [Suspension System: Provide manufacturer’s standard warranty.]
2. Ceiling Elements: Provide manufacturer’s standard 10-year warranty.

# PART 2 – PRODUCTS

## 2.1 SUSPENSION SYSTEM

Retain below for use with suspended ceiling panels. Delete if using ceiling tiles. Delete if existing suspension system is to be reused or is specified in another section. Following text is for standard steel T-bar grid system. In wet areas, vinyl, fiberglass, or aluminum suspension system can match moisture resistance of thermoformed panels.

1. Acceptable Manufacturers:
	1. Armstrong
	2. Rockfon (Chicago Metallic)
	3. USG
	4. [\_\_\_\_\_\_\_\_\_\_]
2. Type: Comply with ASTM C635 [intermediate duty] [heavy duty]
3. Face Width: As required for specified ceiling panels
4. Color: [White] [Black] [match panels] [\_\_\_\_\_\_\_\_\_\_]

## 2.2 CEILING ELEMENTS

1. Manufacturer:
	1. Ceilume: ceilume.com, pro@ceilume.com, 1-877-492-5605
	2. Substitution: [No substitutions] [Submit substitution request in accordance with Division [00] [01] including product samples and product evaluation reports.]
2. Material: Vinyl, rigid, produced without phthalates or softening additives
3. Fire Safety: The approvals and listings apply primarily to ceiling panels. Ceiling tiles are generally acceptable due to their fire safety characteristics and under International Building Code section 803.2.
	1. Surface Burning Characteristics: Class A, tested in accordance with ASTM E84
	2. Flammability: V-0 (self-extinguishing), tested in accordance with UL 94
	3. Classification of Reaction to Fire: B-s2-d0 (0.013” thick styles) or B-s1-d0 (0.030” thick styles), tested in accordance with BS EN 13501-1
4. Evaluation Reports:
	1. California State Fire Marshal: Listing No. 2200-1622:0100
	2. IAPMO UES Evaluation Report 310
	3. Drop-Out Panels: The following approvals and listings have different requirements and limitations; the IAPMO report is the most comprehensive. Review the project with authorities having jurisdiction (AHJ) and with Owner’s insurance advisor, then edit the following according to their advice. See https://www.ceilume.com/drop-out for additional information.
		1. IAPMO UES Report 5021
		2. UL Solutions (UL) Report BLME.R4036
		3. FM Global (FM) Approval Class 4651
5. Environmental Certification: GREENGUARD Gold Certified for low chemical emissions, tested in accordance with UL 2821 test method to show compliance to emission limits on UL2818, and determined compliant in accordance with California Department of Public Health (CDPH) Standard Method V1.2-2017 using an Office and Classroom Environment.

## 2.3 ACCESSORIES

 Locations for accessories should be indicated in Schedule.

1. Ceiling Panel Accessories:

	1. Acoustic Insulation:
		1. Product: Ceilume Soniguard™ Drop Ceiling Insulation
		2. Size: 24” x 24” x 1.4” (nominal)
		3. Material: Fiberglass-free, thermal-bonded, polyester-fiber, non-woven batt
		4. Surface Burning Characteristics: Class A, tested in accordance with ASTM E84
		5. Tested in accordance with ASTM C665, ASTM C1304, ASTM C1338, and ASTM G21 Soniguard has not been tested with fire sprinklers and should not be used in grid squares with penetrating sprinklers. Soniguard is NOT approved for use in drop-out installations.
	2. Grid Covers:
		1. Product: EZ-On Drop Ceiling Grid Covers
		2. Components:
			1. 1” x 24” Main Covers
			2. 1” x 23” Wall Angle Covers
		3. Material: 0.030” thick rigid vinyl
		4. Color: [White] [Onyx] [Mist] [Oat] [Jasper] [Garnet] [match panels] [\_\_\_\_\_\_\_\_\_\_]
	3. Uplift Prevention Clips: Spring steel clips designed to fit over T-bar grid Use uplift prevention clips where wind or changes in air pressure can cause panel movement. They can also be used in schools and other buildings to discourage unauthorized access above ceiling. They are approved for use with drop-out ceilings.
	4. Drop-Out Ceiling Placard: Durable, pre-printed placard with notice that modifications to drop-out ceilings must comply with code requirements. Provide [one on each floor with drop-out ceilings] [\_\_\_\_\_\_\_\_\_\_]. Drop-out ceiling panels must not be replaced with products that are not approved for use beneath sprinklers. Building owners, tenants, and maintenance personnel may be unfamiliar with drop-out ceilings, therefore installations should be marked to inform them. Placards can be mounted next to fire extinguisher cabinets, fire sprinkler valves, or other conspicuous locations.
2. Ceiling Tile Accessories:
If tiles are spaced to create reveals, edit below to add color and quality of paint to be used for reveals.
	1. Adhesive:
		1. Product: Ceilume Ceiling Tile Adhesive
		2. Tested in accordance with ASTM C557 and AFG-01
	2. Self-Adhesive Strips:
		1. Product: Decorative Strips
			1. Size: 1” x 24” with embossed design
			2. Material: 0.030” thick rigid vinyl with adhesive backing
			3. Color: [match tiles] [\_\_\_\_\_\_\_\_\_\_]
		2. Product: Smooth Strips
			1. Size: 1” x 24” with no design
			2. Material: 0.030” thick rigid vinyl with adhesive backing
			3. Color: [match tiles] [\_\_\_\_\_\_\_\_\_\_]

## 2.4 SCHEDULE OF THERMOFORMED CEILING TYPES

 Not all Ceilume panels and tiles are available with all attributes. See ceilume.com for product data prior to specification.

1. Thermoformed Ceiling Panel Type (Lay-In): TFC [01] [\_\_\_\_]
Styles in **BOLD** can be cut and installed as partial panels. If you’re specifying a field style that is **NOT** shown in bold and your ceiling layout includes partial panels, you must also specify a border style.
	1. Field Style: [Alexander] [Aristocrat] [Avalon] [Bella] [Bentley] [Bistro] [Cambridge] [Celestial] [**Century**] [Circle Star] [**Continental**] [Convex] [Coupé] [Dart] **[Diamond Plate**] [Doric] [Empire] [Evangeline] [**Fleur-de-lis**] [Florentine] [Jackson] [Madison] [Medallion] [Mirage] [**Orb**] [Orleans] [**Oxford**] [Petal] [**Polyline**] [**Rattan**] [Regency] [Roman Circle] [**Sahara**] [**Serenity**] [**Southland**] [**Stratford**] [**Stratford NRC.50+**] [**Stratford NRC.85+**] [Victorian] [Westminster] [Insert Ceilume Part #]
	2. [Border Style: [Century] [Continental] [Diamond Plate] [Fleur-de-lis] [Orb] [Oxford] [Polyline] [Rattan] [Sahara] [Serenity] [Southland] [Stratford] [Stratford NRC.50+] [Stratford NRC.85+] [Insert Ceilume Part #]] Panels around perimeter of installation may need to be cut to fit; the deep relief of some ceiling elements make them unsuitable for this application and require the use of border panels. Alternative types of perimeter treatments can be shown on Drawings.
	3. Size: [24” x 24”] [24” x 48”] (nominal)
	4. Material: [0.013”] [0.030”] thick rigid vinyl
	5. Color:
		1. Solids: [White] [Sand] [Stone] [Latte] [Merlot] [Black] [To be selected from manufacturer’s standards.] [\_\_\_\_\_\_\_\_\_\_]
		2. Light-Transmitting (0.013” thick material only): [Translucent] [Frosted] [Clear] [To be selected from manufacturer’s standards.] [\_\_\_\_\_\_\_\_\_\_]
		3. Brushed Metal: [Bronze] [Copper] [Tin] [To be selected from manufacturer’s standards.] [\_\_\_\_\_\_\_\_\_\_]
		4. Woodgrain: [Sandal Wood] [Caramel Wood] [Cherry Wood] [To be selected from manufacturer’s standards.] [\_\_\_\_\_\_\_\_\_\_]
		5. 100% Post-Manufacturing Recycled (0.030” thick material only): [Random Gray] [To be selected from manufacturer’s standards.] [\_\_\_\_\_\_\_\_\_\_]
	6. Installation Method: [1”] [15/16”] [9/16”] wide grid All Ceilume panels are available for use with 15/16” to 1” wide grid. Some are also compatible with 9/16” wide grid; contact Ceilume for availability.
	7. Accessories: Provide [Acoustic Insulation], [Grid Covers], [Uplift Prevention Clips], [Drop-Out Ceiling Placard], and [\_\_\_\_\_\_\_\_\_\_].
	8. Other: [\_\_\_\_\_\_\_\_\_\_]
2. Thermoformed Ceiling Tile Type (Glue-Up): TFC [01] [\_\_\_\_]
Styles in **BOLD** can be cut and installed as partial tiles. If you’re specifying a field style that is **NOT** shown in bold and your ceiling layout includes partial tiles, you must also specify a border style.
	1. Field Style: [Alexander] [Avalon] [Bella] [Bentley] [Bistro] [Cambridge] [Celestial] [**Diamond Plate**] [Empire] [Evangeline] [**Fleur-de-lis**] [Jackson] [**Lafayette**] [**Manchester**] [**Nantucket**] [Orleans] [**Rattan**] [**Sahara**] [Insert Ceilume Part #]
	2. [Border Style: [Diamond Plate] [Fleur-de-lis] [Lafayette] [Manchester] [Nantucket] [Rattan] [Sahara] [Insert Ceilume Part #] Tiles around perimeter of installation may need to be cut to fit; the deep relief of some ceiling elements make them unsuitable for this application and require the use of border tiles. Alternative types of perimeter treatments can be shown on Drawings.
	3. Size: [24” x 24”] [24” x 48”] (nominal)
	4. Material: 0.030” thick rigid vinyl
	5. Color:
		1. Solids: [White] [Sand] [Stone] [Latte] [Merlot] [Black] [To be selected from manufacturer’s standards.] [\_\_\_\_\_\_\_\_\_\_]
		2. Brushed Metal: [Bronze] [Copper] [Tin] [To be selected from manufacturer’s standards.] [\_\_\_\_\_\_\_\_\_\_]
		3. Woodgrain: [Sandal Wood] [Caramel Wood] [Cherry Wood] [To be selected from manufacturer’s standards.] [\_\_\_\_\_\_\_\_\_\_]
		4. 100% Post-Manufacturing Recycled: [Random Gray] [To be selected from manufacturer’s standards.] [\_\_\_\_\_\_\_\_\_\_]
	6. Installation Method: Glue to substrate.
	7. Accessories: Provide [Adhesive], [Self-Adhesive [Decorative] [Smooth] Strips], and [\_\_\_\_\_\_\_\_\_\_].
	8. Other: [\_\_\_\_\_\_\_\_\_\_]

# PART 3 – EXECUTION

## 3.1 PREPARATION

1. Finish all remodeling, sawing, drilling, sanding, and sweeping, and thoroughly clean room prior to installation.
2. Thermoformed Ceiling Panels:
	1. Thoroughly clean T-bar grid to remove contaminants.
	2. Wipe down grid with damp rag to dissipate static electricity.
3. Thermoformed Ceiling Tiles:
	1. Remove textured finishes. Provide smooth, flat substrate.
	2. Thoroughly clean substrate to remove contaminants.
	3. Prime substrate.

## 3.2 INSTALLATION

1. [Suspension System: Install in accordance with manufacturer’s instructions and ASTM C636.]
2. Thermoformed Ceiling Panels:
	1. Install in accordance with manufacturer’s instructions and evaluation reports specified above.
	2. Fire Sprinklers:
		1. [Where fire sprinklers penetrate panels, provide oversize hole in panels or use refacing style with mineral fiber backing panels.]
		2. [Where fire sprinklers are installed above ceiling, provide drop-out ceiling placards at locations indicated by Architect.]
3. Thermoformed Ceiling Tiles: Install in accordance with manufacturer’s instructions.

## 3.3 CLEANING

1. Clean ceilings immediately prior to Substantial Completion.

**END OF SECTION**