09-5000 Ceiling Tile Specifications – BEMO PMC (Metal Perforated Ceiling) Specialties

SECTION 09 50 00

CEILINGS – PERFORATED METAL CEILING PANELS

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PART 1 - GENERAL

1.01 RELATED DOCUMENTS

Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 REFERENCES

1. ASTM C635, Standard Specifications for Metal Suspension Systems for Acoustical Tile and Lay-In Panel Ceilings.
2. ASTM C636, Recommended Practice for Installation of Metal Suspension System for Acoustical Tile and Lay-In Panels.
3. CISCA Ceiling Systems Installation Handbook.
4. ASTM C 423, Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.
5. ASTM A 641 “Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire.
6. ASTM A 653 “Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process.
7. ASTM 1264 “Classification for Acoustical Ceiling Products.
8. ASTM B209 “Standard Specification for Aluminum and Aluminum Alloy Sheet and Plate.

1.03 SUMMARY

1. This Section includes acoustical metal pans and exposed direct-hung suspension systems for ceilings.
2. Related Sections include the following:
	1. Division 9 – Section 09511 – Acoustical Panel Ceilings
	2. Division 15 Sections – Mechanical
	3. Division 16 Sections – Electrical
3. Products furnished, but not installed under this Section.

1.04 SUBMITTALS

1. Product Data: For each type of product indicated.
2. Coordinate Drawings: Reflected ceiling plans drawn to scale and coordinating penetrations and ceiling-mounted items. Show the following:
3. Ceiling suspension members.
4. Method of attaching hangers to building structure.
5. Ceiling-mounted items including lighting fixtures, diffusers, grilles, speakers, sprinklers, access panels, and special moldings.

Samples for Verification: For each component indicated and for each exposed finish required, prepared on Samples of size indicated below.

1. Metal Pan: Manufacturer standard samples of each type, finish, color, pattern, and texture. Show pan edge profile.
2. UL Suspension System Load Compliance: Manufacturer must certify that the metal suspension system is UL Classified to be load compliant per ASTM C635. For load compliance, each carton of main tees must carry Underwriter’s Laboratory certification for load compliance.

1.05 DELIVERY, STORAGE, AND HANDLING

1. Delivery of materials: Deliver materials in original unopened packages, clearly labeled with manufacturer’s name, item description, specification number, type, and class as applicable.
2. Inspection: Promptly inspect delivered materials, file freight claims for damage during shipment, and order replacement materials as required. Any damaged materials shall be promptly removed from the job site.
3. Storage: Store in manner that will prevent warpage, water damage, or damage of any kind. Prevent interference to/by other trades and any other adverse job conditions due to storage locations or methods.
4. Handling: Handle in such a manner as to ensure against racking, distortion, or physical damage of any kind.

1.06 QUALITY ASSURANCE

1. Manufacturer and Installer Qualifications: Provide Acoustical Metal Pan Ceiling components produced by a single manufacturer with resources adequate to deliver a product of consistent quality in terms of appearance and physical properties for all project scopes and scales without risk of delay or interruption; Installation work to be performed by a firm whose personnel have no less than three (3) years of successful experience on metal projects of similar size, requirements, and complexity
2. Subcontractor qualification: Installer shall have successful experience installing suspension and finish systems.
3. Requirements of regulatory agencies: Codes and regulations of authorities having jurisdiction.
4. Source quality control: Manufacturer will provide test certification for suspension systems as required to meet performance standards specified by various agencies.
5. Pre-installation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Meetings."

1.07 PROJECT CONDITIONS

1. Building conditions: Building shall be enclosed with all windows and exterior doors in place and glazed, and the roof watertight before installation of suspension system.

1.08 INTERIOR TEMPERATURE/HUMIDITY

1. Climatic conditions in areas to receive ceiling suspension systems shall range from 60°F (16°C) to 85°F (29°C) and relative humidity of not more than 80% shall be maintained before installation of components.
2. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
3. 3-Dimensional Ceiling Panels: Furnish quantity of full-size units equal to \_\_\_\_ % of amount installed.

PART 2 - PRODUCTS

2.01 PRODUCTS AND MANUFACTURERS

1. Bemo USA Corporation Brand BEMO Perforated Metal Ceiling Panels: Manufactured or supplied by Bemo USA Corporation., Mesa, AZ, USA, in compliance with applicable ASTM Standards.
2. DONN Brand suspension systems, Donn Brand Centricitee DXT/DXLT 9/16”, Donn Brand AX/AXCE 15/16” (USG brand)
	1. METAL PANS FOR BEMO USA CORPORATION, BEMO PMC PANEL
3. Products: BEMO PMC (Perforated Metal Ceiling) Panel System
4. BEMO PMC Weave: Lay-In panel system in an exposed standard flat T-bar grid creating a ceiling with easy lift-up access. Panels can be laid flush with the grid or with a reveal (tegular).
5. BEMO PMC Mid-Century: Lay-In panel system in an exposed standard flat T-bar grid creating a ceiling with easy lift-up access. Panels can be laid flush with the grid or with a reveal (tegular).
6. BEMO PMC Rain: Lay-In panel system in an exposed standard flat T-bar grid creating a ceiling with easy lift-up access. Panels can be laid flush with the grid or with a reveal (tegular).
7. BEMO PMC Diamond: Lay-In panel system in an exposed standard flat T-bar grid creating a ceiling with easy lift-up access. Panels can be laid flush with the grid or with a reveal (tegular).
8. BEMO PMC Round: Lay-In panel system in an exposed standard flat T-bar grid creating a ceiling with easy lift-up access. Panels can be laid flush with the grid or with a reveal (tegular).
9. BEMO PMC Custom: Lay-In panel system in an exposed standard flat T-bar grid creating a ceiling with easy lift-up access. Panels can be laid flush with the grid or with a reveal (tegular). Pattern determined
10. Classification: Units complying with ASTM E 1264 for [Type V, perforated steel facing (pan) with mineral or glass fiber base backing] [Type VI, perforated stainless steel facing (pan) with mineral or glass fiber base backing] [Type VII, perforated aluminum facing (pan) with mineral- or glass-fiber-base backing] ]Type XX, other types described as perforated aluminum facing (pan) units] [Type XX, other types described as perforated non-aluminum, non-steel or non stainless steel facing (pan) units]
11. Panel Size: Refer to Reflected Ceiling Plan and schedule for custom sizes.
12. Panel Size: 24 x 24 inches (610 x 610 mm).
13. Panel Size: 24 x 48 inches (610 x 1219 mm).
14. Panel Joints: Flush lay-in; panel face installed in-line with grid level.
15. Panel Joints: Tegular Lay-in; panel face sits below grid level.
16. Pan Type: Tegular and Lay-in pan
17. Aluminum Pan Thickness: Not less than 0.020” minimum, steel pan thickness: not less than 24ga minimum,
18. Pan Size: 2’ x 2’, 2’ x 4’, custom \_\_\_\_\_\_\_\_\_
19. Pan Face Finish: Painted to match color indicated by product designation
20. Acoustical Metal Pan Standard: Provide manufacturer’s standard acoustical metal pans of configuration indicated that comply with ASTM E 1264 classifications as designated by types, acoustical ratings, and light reflectance, unless otherwise indicated.
21. Sheet Metal Characteristics: For metal fabrications exposed to view in the completed Work, provide materials with smooth, flat surfaces without blemishes. Do not use materials with exposed pitting, seam marks, roller marks, roughness, stains, or discolorations.
22. Aluminum Sheet: Roll-formed aluminum sheet, complying with ASTM B 209; alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated. 3003-H14 or 3105-H14
23. Steel Sheet: Roll-formed steel sheet, complying with ASTM A653; alloy and temper recommended by steel producer and finisher for type of use and finish indicated.
24. Pan Fabrication: Manufacturer’s standard units of size, profile, and edge treatment indicated, formed from metal indicated and finished to comply with requirements indicated.
25. Tegular pans: Formed to set in exposed suspension grid.
26. Lay-in Pans: Formed to set in exposed suspension grid.
	1. ACOUSTICAL PROPERTIES

Sound-Absorbent Fabric Layer: Provide fabric layer, sized to fit concealed surface of pan, and consisting of [black], nonwoven, nonflammable, sound-absorbent material with surface-burning characteristics for flame spread index of 25 or less and smoke-developed index of 50 or less, as determined by testing per ASTM E 84.

Dark Surfaced, Rigid Fiberglass Board Insulation: ASTM C 1338, G 21, 22; faced on one side with black glass fiber mat finish; maximum flame spread, and smoke developed indexes of 25 and 50 respectively, per UL 723; manufactured using a bio-based  binder.

1. Basis-of-Design Product: Knauf Insulation Black Acoustical Board.
2. Nominal density of 2.25 lb./cu. ft. (36 kg/cu. m), thermal resistivity of 8.7  (R-SI Range 1.53).
	1. Thickness: 2 inches (51 mm)
3. Nominal density of 3.0 lb./cu. ft. (48 kg/cu. m), thermal resistivity of 4.3 to 8.7  (R-SI Range 0.76 to 1.53) depending on thickness.
	1. Thickness: [**1 inch (25 mm)**] [**1.5 inches** **(38 mm)**] [**2 inches** **(51 mm)**].
4. Sustainability Requirements: Provide fiberglass board insulation as follows:
5. Free of Formaldehyde: Insulation manufactured with 100 percent bio-based binders.
6. Low Emitting: Insulation tested according to ASTM D 5116 and shown to emit less than 0.05 ppm formaldehyde. Certified to UL GREENGUARD Gold standards.

2.04 METAL SUSPENSION SYSTEMS

DONN Brand Suspension Systems – Commercial quality, cold-rolled steel, hot-dipped galvanized steel body. Materials Exposed surfaces color: coordinate with color of selected ceiling panels. Edge trim: Optional; COMPÄSSO (select height)

 1. USG DONN CENTRICITEE DXT Acoustical Suspension System

1. Main Tees: Double-web design, Intermediate Duty classification, 1-1/2” high x [10’], [12’] long; square bulb; 9/16” exposed double-hemmed bottom flange with roll-formed steel cap; cross tee holes and hanger wire holes at [6”], [10”] o.c.; integral reversible splices.
2. Cross tees: Double web design, 1-1/8” high x 24” and 48” long, rectangular bulb; exposed hemmed bottom flange with roll-formed steel cap; end clenched to web.
3. Main and cross tees shall be positively locked, yet removable without need for the use of tools.
4. Wall molding: Angle shape; with 15/16” mounting flange by 9/16” face flange; exposed surface prefinished to match suspension system components.
5. Hanger wire: galvanized carbon steel; soft temper; prestretched; yield stress load at least three times design load; not less than 12 gauge.
6. DONN Brand DX Acoustical Suspension System
7. Main tees: Double-web design, Intermediate Duty classification; 1-1/2” high x 12’ long; rectangular bulb; 15/16” exposed double-hemmed bottom flange with roll-formed steel cap; cross tee holes and hanger wire holes at [6”], [10”] o.c.; integral reversible splices.
8. Cross tees: 1” high x 24” or 48” long; rectangular bulb; exposed bottom flange with roll-formed steel cap; end clenched to web.
9. Main and cross tees shall be positively locked, yet removable without need for the use of tools.
10. Wall molding: Angle shape with 7/8” mounting flange by 7/8” face flange; exposed surface prefinished to match suspension system components
11. Hanger wire: galvanized carbon steel; soft temper, pre-stretched; yield stress load at least three times design load; not less than 12 gauge.

2.05 INSTALLATION

* + - * 1. General: Install acoustical metal pan ceilings to comply with ASTM C 636/C 636M and seismic design requirements indicated, according to CISCA's "Ceiling Systems Handbook."
				2. Suspend ceiling hangers from building's structural members and as follows:
1. Install hangers’ plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.
2. Splay hangers only where required to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
3. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings required to support standard suspension-system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices.
4. Secure wire hangers to ceiling suspension members and to supports above with a minimum of three tight turns. Connect hangers directly either to structures or to inserts, eye screws, or other devices that are secure and appropriate for substrate and that do not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.
5. Secure flat, angle, channel, and rod hangers to structure, including intermediate framing members, by attaching to inserts, eye screws, or other devices that are secure and appropriate for both structure to which hangers are attached and hanger type involved. Install hangers in a manner that does not cause them to deteriorate or fail due to age, corrosion, or elevated temperatures.
6. Do not support ceilings directly from permanent metal forms or floor deck. Fasten hangers to cast-in-place hanger inserts, post installed mechanical or adhesive anchors, or power-actuated fasteners (if allowed) that extend through forms into concrete.
7. When steel framing does not permit installation of hanger wires at spacing required, install carrying channels or other supplemental support for attachment of hanger wires.
8. Do not attach hangers to steel deck tabs.
9. Do not attach hangers to steel roof deck unless permitted by structural engineer and authorized persons with jurisdiction. Written documentation and authorization required. Attach hangers to structural members.
10. Space hangers not more than 48 inches o.c. along each member supported directly from hangers unless otherwise indicated; provide hangers not more than 8 inches from ends of each member.
11. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards and publications.
	* + - 1. Secure bracing wires to ceiling suspension members and to supports with a minimum of four tight turns. Suspend bracing from building's structural members as required for hangers, without attaching to permanent metal forms, steel deck, or steel deck tabs. Fasten bracing wires into concrete with cast-in-place or post installed anchors.
				2. Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical metal pans.
				3. Apply acoustical sealant in a continuous ribbon concealed on back of vertical legs of moldings before they are installed.
				4. Screw attach moldings to substrate at intervals not more than 16 inches o.c. and not more than 3 inches from ends, leveling with ceiling suspension system to a tolerance of 1/8 inch in 12 feet. Miter corners accurately and connect securely.
				5. Do not use exposed fasteners, including pop rivets, on moldings and trim.
				6. Install suspension-system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.
				7. Cut acoustical metal pan units for accurate fit at borders and at interruptions and penetrations by other work through ceilings. Stiffen edges of cut units as required to eliminate evidence of buckling or variations in flatness exceeding referenced standards for stretcher-leveled metal sheet.
				8. Install acoustical metal pans in coordination with suspension system and exposed moldings and trim. Comply with installation tolerances according to CISCA's "Metal Ceilings Technical Guidelines."
		1. For lay-in, square-edge pans, install pans with edges fully hidden from view by flanges of suspension-system runners and moldings.
		2. For lay-in, reveal-edge pans on suspension-system runners, install pans with bottom of reveal in firm contact with top surface of runner flanges.
		3. For lay-in, reveal-edge pans on suspension-system members with box-shaped flanges, install pans with reveal surfaces in firm contact with suspension-system surfaces and panel faces flush with bottom face of runners.
		4. Fit adjoining units to form flush, tight joints.
		5. Install directionally patterned or textured metal pans in directions indicated.
		6. Install sound-absorbent fabric layers in, perforated metal pans.
		7. Install sound-absorbent pads in perforated metal pans[**over metal spacer grids**].
			+ 1. Install hold-down clips where indicated.

2.06 CLEANING

Clean exposed surfaces of acoustical metal pan ceilings, including trim and edge moldings, after removing strippable, temporary protective covering, if any.

1. Removal of protective covering shall occur immediately after installation to prevent adhesive transfer.
2. Clean all surfaces following installation.
3. Maintenance per manufacturer's finish maintenance instructions.
	1. PROTECTION
	2. Protection of ceiling panels from damage by other trades after installation to be provided by general contractor. Remove and replace ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage, including dented and bent units.

END OF SECTION