

SECTION 095800 – CLOSED EDGE GFRP INSULATED LAY-IN CEILING PANELS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes:
 - 1. Gel coat fiberglass reinforced polymer composite insulated lay-in ceiling panels for interior ceilings including:
 - a. Closed edge insulated lay-in ceiling panels.
 - b. Sealants, tape, gaskets, fasteners, and other components required for a complete, sealed, lay-in ceiling assembly.
- B. Related Sections:
 - 1. Section 068320 - GFRP Composite Molded Architectural Shapes.
 - 2. Section 083110 – Acrylic Access Doors and Panels.
 - 3. Section 095810 – Acryloyl Engineered Polymer Lay-In Ceiling Panels.
 - 4. Section 095820 – Fiberglass Suspended Ceiling Inverted Tee Rail System.

1.3 REFERENCES

- A. American Society of Mechanical Engineering (ASME).
 - 1. ASME N510 document, Testing of Nuclear Air Treatment Systems (1989).
- B. ASTM International (ASTM)
 - 1. ASTM D523-14: Standard Test Method for Specular Gloss.
 - 2. ASTM D570-98: Standard Test Method for Water Absorption of Plastics.
 - 3. ASTM D638-14: Standard Test Method for Tensile Properties of Plastics.
 - 4. ASTM D695-15: Standard Test Method for Compressive Properties of Rigid Plastics.
 - 5. ASTM D696-16: Standard Test Method for Coefficient of Linear Thermal Expansion of Plastics Between -30°C and 30°C with a Vitreous Silica Dilatometer
 - 6. ASTM D790-17: Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials
 - 7. ASTM D1308-02 (2013): Standard Test Method for Effect of Household Chemicals on Clear and Pigmented Organic Finishes
 - 8. ASTM D1621-16: Standard Test Method for Compressive Properties of Rigid Cellular Plastics.
 - 9. ASTM D1929-20: Standard Test Method for Determining Ignition Temperature of Plastics.
 - 10. ASTM D2583-13: Standard Test Method for Indentation Hardness of Rigid Plastics by Means of a Barcol Impressor

11. ASTM D2843-19: Standard Test Method for Density for Smoke from the Burning or Decomposition of Plastics.
 12. ASTM D3273-16: Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber.
 13. ASTM D3274-09: Standard Test Method for Evaluating Degree of Surface Disfigurement of Paint Films by Fungal or Algal Growth, or Soil and Dirt Accumulation.
 14. ASTM E84-19b: Surface Burning Characteristics of Building Materials.
 15. ASTM E96-16: Standard Test Methods for Water Vapor Transmission of Materials.
 16. ASTM E831-19: Standard Test Method for Linear Thermal Expansion of Solid Materials by Thermo-Mechanical Analysis.
- C. European Committee for Standardization (CEN)
1. Classification of Reaction to Fire Performance in accordance with EN 13501-1: 2007 + A1: 2009.
- D. International Organization for Standardization (ISO)
1. ISO 846: 2019: Plastics - Evaluation of the action of microorganisms.
 2. ISO 2812-4:2017: Paints and varnishes - Determination of resistance to liquids - Part 4: Spotting Methods.
 3. ISO 9705-1:2016, Annex B: Full-scale Room Test for Surface Products.
- E. United States Department of Health and Human Services,
1. Centers for Disease Control (CDC): Biosafety in Microbiological and Biomedical Laboratories (BMBL); Sixth Edition, 2021.
 2. National Institutes of Health: Design Policy and Guidelines, 2016.
- F. The Public Health Agency of Canada
1. The Laboratory Biosafety Guidelines: 3rd Edition 2004.
- G. Australia / New Zealand
1. PC4 Biosafety Guidelines.
- H. UK Public Health
1. ACDP4 Biosafety Guidelines.
- I. Compliance
1. New York City MEA Approval 414-04-M - University of Pittsburgh Test Protocol for Measurement of Acute Lethality of Thermal Decomposition Products from Specimen.
 2. Seismic Testing – Seismic requirements of NAS 4219 and ICC-ES AC156 (US) for Arcoplast wall and ceiling system
 3. Determination of Extractives Residue according to US FDA 21 CFR 177.2600 Arcoplast finishing compound/sealant
 4. Living Building Challenge 3.1 Red List (Declare Label).

J. Electromagnetic Compatibility Test Report #G105789756GRR-001 Rev.

1. Non-Standard Differential Radio Frequency Attenuation:

- a. 0.9 GHz
- b. 2.437 GHz
- c. 5 GHz
- d. 6.515 GHz

1.4 SUBMITTALS

A. Comply with Section 013300 - Submittal Procedures.

B. Product Data: Submit manufacturer's product data including installation instructions.

C. Sustainable Design Submittals:

1. Credit MRc4: Building product disclosure and optimization - material ingredients. Option 1. Material ingredients reporting.

- a. Manufacturer to provide Declare Product Label indicating all ingredients have been evaluated down to 1,000 ppm.

2. Credit EQc2: Low-emitting materials.

- a. Manufacturer to provide product data for installation adhesives, including printed statement of VOC content and material safety data sheets

D. Shop Drawings: Submit manufacturer's shop drawings, including plans, elevations, sections, and details, indicating composite ceiling panels, wall panels, wall base, joints, radius joints, finish junctions at wall-to-wall, wall-to-ceiling, wall-to-floor, wall-to-window/door frames, mastic or tape adhesive, and attachment screws.

1. Indicate size and location of wall openings and penetrations.
2. Indicate items to be supported by walls. Include loads.
3. Indicate method of sealing joints, openings, and penetrations.
4. Suspension system spacing and details.
5. Splicing, joint treatment, and fastening details of ceiling panels.
6. Changes in ceiling planes, openings, and intersections with vertical element.
7. Ceiling access door dimensions and location.

E. Samples: Submit manufacturer's samples.

1. Composite ceiling panels.
2. Composite wall panels.
3. Wall base.
4. Attachment joints.
5. Finishing compound detailing.

F. Manufacturer's Certification: Submit manufacturer's certification that materials comply with specified requirements and are suitable for intended application.

1.5 WARRANTY

- A. Warranty: Submit manufacturer's standard warranty. The manufacturer guarantees the product supplied shall be free of defects in material or workmanship under normal use and service.

1. Warranty Period: Five years from date of delivery.

1.6 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Lay-In Ceiling Panels: Full-size panels equal to 2 percent of quantity installed.
2. Hold-Down Clips: Equal to 2 percent of quantity installed.

1.7 QUALITY ASSURANCE

- A. Source Limitations: Obtain gel coat fiberglass reinforced polymer composite panels and accessories from a single manufacturer.

- B. Manufacturer's Qualifications: Minimum five-year's experience constructing BSL3E and/or BSL4 spaces with polymer paneling systems and accessories. Manufacturer shall have completed at least one project containing partitions within BSL4 or equivalent (Australia/New Zealand PC4, Public Health Agency of Canada CL4, UK ACDP4) containment.

- C. Installer/Applicator Qualifications: Manufacturer-trained and certified specialty installer/applicators with minimum 2-years' experience constructing BSL3E and/or BSL4 spaces with polymer paneling systems and accessories. Manufacturer shall have completed at least one project containing partitions within BSL4 or equivalent (Australia/New Zealand PC4, Public Health Agency of Canada CL4, UK ACDP4) containment.

- D. Mockups: in addition to the High Containment Technical Mockup specified in Section 014339.13 "High Containment Mockups."

1. Before installing entire installation, build Wall Mockup to demonstrate polymer paneling systems aesthetic effects and set quality standards for materials and execution.

- a. Notify Architect/Engineer two weeks prior to date when approval is requested. Construct mock-up with the following finishes, penetrations, and fittings:

- 1) Typical transition from flooring to wall, with wall base.
- 2) Typical electrical duplex outlet.
- 3) Typical wall corner.
- 4) Typical wall attachment.

2. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

- E. Preinstallation Conference: Conduct conference at Project site as specified in Section 013100 "Project Management and Coordination."

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Delivery: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.
- B. Storage:
 - 1. Store materials in clean, dry area indoors in accordance with manufacturer's instructions.
 - 2. Composite Panels: Store flat.
 - 3. Finishing Compound: Store for a maximum of 6 months from date of shipment at temperature of 50 degrees F to 80 degrees F (10 degrees C to 27 degrees C).
 - 4. Adhesive: Store for a maximum of 6 months from date of shipment at temperatures below 80 degrees F (27 degrees C).
- C. Before installing lay-in ceiling panels, permit them to reach room temperature.
- D. Handling: Protect materials and finish from damage during handling and installation in accordance with manufacturer's instructions.

1.9 FIELD CONDITIONS

- A. Environmental Limitations: Do not install lay-in ceilings until spaces are enclosed and weatherproof, wet work in spaces is complete and dry, work above lay-in ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.
 - 1. Pressurized Plenums: Operate ventilation system for not less than 48 hours before beginning lay-in ceiling panel installation.
- B. Maintain the following conditions during and after installation in areas to receive materials.
 - 1. Minimum Temperature: 60 degrees F (15 degrees C).
 - 2. Relative Humidity: 20 to 60 percent.

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Basis of Design: Subject to compliance with requirements, provide the following by **ARCOPLAST, 106 Crafton Drive, O'Fallon, Missouri 63366**. Toll Free (888) 736-2726. Phone (636) 978-7781. Fax (636) 978-7782. Web Site: www.arcoplast.com.

2.2 TR35 i-PANEL – CLOSED EDGE GFRP INSULATED LAY-IN CEILING PANELS

- A. Lay-In Ceiling Panels: Gel coat fiberglass reinforced polymer composite panels with insulated core, closed edge panels composed of chop strand mat impregnated with fire-rated resin.
 - 1. Panel Thickness: 5/8 inch (16mm), 1 inch (25mm), 1-1/2 inch (38mm), 2 inch (50mm).
 - 2. Sizes: 2 x 2 (600mm x 600mm), 2 x 4 (600 mm x 1200mm), 4 x 4 (1200mm x 1200mm).
 - 3. Color: White.

2.3 PERFORMANCE REQUIREMENTS

- A. Surface-Burning Characteristics: Comply with ASTM E84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - 1. Flame-Spread Index: Class A according to ASTM E1264.
 - 2. Smoke Development Index: 450 Or less.
- B. Acoustical Properties:
 - 1. Noise Reduction Coefficient: NRC: 0.20
 - 2. Sound Absorption Average: SAA: 0.19

2.4 SUSPENSION SYSTEM

- A. Refer to Section 095820 – Fiberglass Suspended Rail System for ceiling suspension system.

2.5 ACCESSORIES

- A. Sealant:
 - 1. Option 1: Silicone Dowsil 786 for sealing between lay-in ceiling panel and grid flange (per USDA requirements).
 - 2. Option 2: Sealant and Finishing Compound A-1010 Bio-Seal:
 - a. Pick proof two-component, 1:1 mix, non-sag, non-porous, non-yellowing, high-gloss, odor-free, solvent-free sealant and finishing compound A-1010 Bio-Seal.
 - 1) Solids: 100 percent.
 - 2) Color: Match panel color.
 - 3) FDA Approved: Determination of Extractives Residue according to US FDA 21 CFR 177.2600 Arcoplast finishing compound/sealant.
 - 4) NSF Approved: Registration #148103.
- B. Tape: To be used to seal cut edge of TR35 i-Panel ceiling panels.
 - 1. Polyester Super Bond Film transparent 2" tape # 396 by 3M.
- C. Gasket:
 - 1. Option 1: TR35 Foam Seal - 1/16" x 1/2" (1.5mm x 12.4mm) polyethylene closed cell foam - Color White - Factory applied to rail sections.
 - 2. Option 2: TR35 Aqua Fin Seal - 5/16" x 1/2" (7.9mm x 11.1mm) Clear silicone gasket extrusion -Factory applied to rail sections.
 - 3. Option 3: TR35 Bubble Seal - 1/4" x 1/2" (6mm x 12.5mm) Clear silicone gasket extrusion - Factory applied to rail sections.
- D. Ceiling Panel Latch: White molded plastic latch with nylon bolt & nut assembly set.
- E. Fasteners: coated or stainless steel screws, size and type consistent with installation conditions.
- F. Hold-down clips.

PART 3 - EXECUTION**3.1 EXAMINATION**

- A. Examine substrates, areas, and conditions, including structural framing to which lay-in ceilings attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect lay-in ceiling installation and anchorage and with requirements for installation tolerances and other conditions affecting performance of lay-in ceilings.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Measure each ceiling area and establish layout of lay-in ceiling panels to balance border widths at opposite edges of each lay-in ceiling. Avoid using less-than-half-width panels at borders and comply with layout shown on reflected ceiling plans.

3.3 INSTALLATION

- A. General: Install lay-in ceiling panels to comply with ASTM C 636/C 636M and seismic design requirements indicated, according to manufacturer's written instructions and CISCA's "Ceiling Systems Handbook."
- B. Install lay-in ceiling panels with undamaged edges and fit accurately into suspension-system runners and edge moldings. Scribe and cut panels at borders and penetrations to provide a neat, precise fit.
- C. For cut edge panels apply Polyester Super Bond Film Transparent 2" tape # 396 by 3M to entirety of cut surface.
 - 1. Install hold-down clips in areas indicated, in areas required by authorities having jurisdiction, and for fire-resistance ratings; space as recommended by panel manufacturer's written instructions unless otherwise indicated.
 - 2. For USDA Registered Establishment projects, replace hold-down clips with a continuous ribbon of Dowsil Silicone 786 (White) applied directly on the edge of the of the inverted tee bar prior to installing the lay-in ceiling panel. Remove any excess and clean thoroughly.
 - 3. Protect lighting fixtures and air ducts to comply with requirements indicated for fire-resistance-rated assembly.
- D. Field cut panels as necessary in accordance with manufacturer's instructions.
- E. Sealants: Apply sealants in accordance with sealant manufacturer's instructions and shop drawings.
 - 1. Seal joints, openings, and penetrations in accordance with manufacturer's instructions and shop drawings.
- F. Repair minor damages to composite ceiling panel finish in accordance with manufacturer's instructions and as approved by Architect.

- G. Remove and replace damaged components that cannot be successfully repaired as determined by Architect.
- H. Primary ceiling panel system shall be installed and sealed per manufacturers written instructions to comply with project requirements and testing; including but not limited to the following:
 - 1. Rooms tested for positive/negative pressure.
 - 2. Room sterilized for micro-bacterial decontamination without risk of transfer of fumes to adjoining spaces.
 - 3. Rooms sealed to prevent cross-contamination between rooms and service corridors.

3.4 CLEANING

- A. Clean exposed surfaces of lay-in ceiling panels, including trim, edge moldings, and suspension-system members. Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage. Remove and replace lay-in ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

3.5 PROTECTION

- A. Protect installed ceiling panels from damage.
- B. Allow 24 hours curing time before pressure wash down sanitation procedures.

3.6 COMMISSIONING

- A. Room commissioning shall be performed by third party Commissioning Agency and reviewed by qualified radiation Physicist.
- B. Manufacturer shall have representative present at time of Commissioning Testing.
 - 1. Provide manufacturer 10 day notice prior to the scheduled testing.

END OF SECTION 095800