SECTION 066200 (06 62 00) - GLASS-FIBER REINFORCED POLYMER COMPOSITE WALL AND CEILING PANELS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This section includes:

1. Glass-fiber reinforced polymer composite panels and accessories for interior walls.
2. Suspended glass-fiber reinforced polymer composite ceiling panels for interior ceilings including:

    a. Suspension systems.
    b. Ceiling panels.
    c. Spline, joint covers, mastic, finishing compound, sealants, fasteners, and other components required for a complete, hermetically sealed, ceiling assembly.
    d. Ceiling access doors.
    e. Finishing Accessories.

B. Related Sections:

1. Section 054000 – Cold-Formed Metal Framing
2. Section 082200 - Fiberglass Reinforced Polymer (FRP) Doors.
3. Section 092216 – Non-Structural Metal Framing

1.3 REFERENCES

A. ASTM C 364 - Standard Test Method for Edgewise Compressive Strength of Sandwich Constructions.

B. ASTM C 393 - Standard Test Method for Flexural Properties of Sandwich Constructions.

C. ASTM D 523 - Standard Test Method for Specular Gloss.

D. ASTM D 638 - Standard Test Method for Tensile Properties of Plastics.

E. ASTM D 695 - Standard Test Method for Compressive Properties of Rigid Plastics.

F. ASTM D 696-03 - Standard Test Method for Coefficient of Linear Thermal Expansion.

G. ASTM D 790-03 - Standard Test Methods for Flexural Properties.

H. ASTM D 1621 - Standard Test Method for Compressive Properties of Rigid Cellular Plastics.

I. ASTM D 2583 - Standard Test Method for Indentation Hardness of Rigid Plastics by Means of a Barcol Impressor.

J. ASTM E 84 - Surface Burning Characteristics of Building Materials.

K. ISO 9705-Annex B: 1993 (E) Full-scale room test.

L. New York City MEA Approval 414-04-M - University of Pittsburgh Test Protocol for Measurement of Acute Lethality of Thermal Decomposition Products from Specimen.

M. Canadian Military Standard (Mils) 1073.2 - Impact Resistance Test.

N. ASTM E 96-05 - Standard Test Methods for Water Vapor Transmission of Materials.

O. New York City MEA Approval 414-04-M - University of Pittsburgh Test Protocol for Measurement of Acute Lethality of Thermal Decomposition Products from Specimen.

P. ASTM E831-06 – Standard Test Method for Linear Thermal Expansion of Solid Materials by Thermo-Mechanical Analysis

Q. Seismic Testing – Seismic requirements of NZS 4219 (2009) and ICC-ES AC156 (US) for Arcoplast wall and ceiling system

R. ISO 846 - Plastics - Evaluation of the action of microorganisms- Resistance to Fungi & Bacteria Test method

S. ASTM D3273-00 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber

T. 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

U. ISO 2812-4:2007 and ASTM D1308-02 (2013) - Chemical Resistance Testing of Arcoplast fiberglass composite panels

V. Determination of Extractives Residue according to US FDA 21 CFR 177.2600 Arcoplast finishing compound/sealant

1.4 SUBMITTALS

A. Comply with Section 013300 - Submittal Procedures.

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

C. 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.

D. Samples: Submit manufacturer's samples.

1. Composite ceiling panels.
2. Composite wall panels.
3. Wall base.
4. Attachment joints.
5. Finishing compound detailing.
6. Aluminum extrusion “Flush Glazing”

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

F. 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 for a period of five years from the date of delivery.

1.5 QUALITY ASSURANCE

A. Manufacture Qualifications: Provide at time of bid; a list of references and comparable installations for Owner and Architect to contact and visit.

B. Installer Qualifications: An experienced installer certified by composite panel Manufacturer for type of installation required.

C. Mockups: Before installing entire installation, build ROOM MOCK-UP to demonstrate mechanics, aesthetic effects and set quality standards for materials and execution.

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

D. Source Limitations: Obtain glass-fiber reinforced polymer composite panels and accessories from single manufacturer.

1.6 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. Handling: Protect materials and finish from damage during handling and installation in accordance with manufacturer's instructions.

1.7 ENVIRONMENTAL REQUIREMENTS

A. Do not install materials until building is enclosed and areas to receive materials are protected from dirt and dust.

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, 1873 Williamstown Drive, St. Peters, Missouri 63376. Toll Free (888) 736-2726. Phone (636) 978-7781. Fax (636) 978-7782. Web Site www.arcoplast.com.

1. Arcoplast for BSL-3 Environment
2. Arcoplast for BSL-3 Ag Environment
3. Arcoplast for BSL-4 Environment

2.2 GLASS-FIBER REINFORCED POLYMER COMPOSITE CEILING AND WALL PANELS

A. Wall and Ceiling Panels: Gel coat polymer-faced, solid glass resin matrix core panels with grooved edge composed of chop strand mat impregnated with fire-rated resin.

1. Panel Thickness: 3/8 inch (9.5mm), 1/2 inch (12.5mm), 3/4 inch (19mm).
2. Size: Custom, maximum 4’ (1.2m) wide (up to 30’ (9m) long.
3. Color: White

B. Physical Properties of Polymer-Faced Solid Glass Resin Matrix Core Panels: 3/8-inch thickness (9.5mm).

1. Tensile Strength, ASTM D 638: 10,141 psi.
2. Tensile Modulus, ASTM D 638: 10.07 Mpsi.
3. Flexural Strength, ASTM D 790: 21,101 psi.
4. Flexural Modulus, ASTM D 790: 0.793 Mpsi.
5. Compressive Strength, ASTM D 695: 15,920 psi.
6. Compressive Modulus, ASTM D 695: 1.467 Mpsi.
7. Barcol Hardness, ASTM D 2583: 56.8.
8. Water Vapor Transmission, ASTM E 96: Less than 0.01 perms, 73 degrees F at 50 percent relative humidity.
9. Surface Burning Characteristics, ASTM E 84 and CAN/ULC-S102-10, Whole Panel, Class A:
    a. Flame Spread Index: 25.
    b. Smoke Development: 450.
10. Gloss Property, ASTM D 523: 99.7 reflectance at 85-degree light source.
11. Impact Resistance Test, Mils 1073.2: No damage on impact from 2-pound (1-kg) steel ball dropped 17 feet.
12. Coefficient of Linear Thermal Expansion, ASTM D 696: 31.4 in/in ºF x 10º - 50ºF -104ºF.

13. Approval: New York City MEA Approval 414-04-M.
14. ASTM E831-06 – Standard Test Method for Linear Thermal Expansion of Solid Materials by Thermo-Mechanical Analysis.
15. Seismic Testing – Lateral movement at joints.

C. Wall and Ceiling System Mock-Up Testing for Polymer-Faced Solid Glass Resin Matrix Core Panels:

1. Vacuum Decay Testing on Arcoplast Wall and Ceiling System Mock-up for High Containment Levels BSL-3, BSL-3 Ag, BSL-4:

   a. Reference – The Public Health Agency of Canada document - Laboratory Biosafety Guidelines: 3rd Edition 2004.
   b. ASME N 510 – Testing of Nuclear Air Treatment Systems.

2. Supplemental Helium Leak Test.

3. Pressure Leak Testing with various MEP interface system for a High Containment Levels BSL-3, BSL-3 Ag, BSL-4:

   a. The Public Health Agency of Canada – Laboratory Biosafety Guidelines: 3rd Edition (2004).

      1) Sealed Metal Duct interface with Arcoplast composite panel
      2) Electrical Box face plate interface with Arcoplast composite panel
      3) Expansion / Contraction joint system interface with Arcoplast composite panel
      4) Panel penetration by mechanical fastener
      5) ASME N 510 – Testing of Nuclear Air Treatment Systems.
      6) Arcoplast Flush Glazed Window Test Report NC-ARC 14810 A-01
      7) ISO 9705-Annex B: 1993 (E) Full-scale room test.

4. Polymer-faced solid glass resin matrix core composite panels under guidelines NIH/CDC biological decontamination procedures using:

   a. Chlorine Dioxide
   b. Formaldehyde Gas
   c. Hydrogen Peroxide Vapor

5. Pull-Out Strengths of mechanical fasteners

2.3 ACCESSORIES

A. Trim Accessories: Manufacturer's standard finishing accessories designed to provide air tight, leak proof and gas tight seal available in thickness from .060” to 1.250 in various sizes and may be installed in wall or ceiling panels.

1. Finishing Accessories include the following:

   a. Grommets
   b. Face Plates
   c. Device Trim Plates
   d. Fire Outlet Boxes
   e. Slip Connections
   f. Access Doors
   g. Escutcheons

h. Cabinets

2. Acrylic finishing accessories are labeled as combustible and classified by UL as slow burning plastic. Protect material from flames and high heat sources.

a. Flame Spread: 140 per 3mm thickness – ASTM E 84
b. Smoke Density: 10.3% - ASTM D 2843
c. Self Ignition temperature: 910F (1.5mm) thickness – ASTM D 1929

3. Flush Glazed Window Unit

a. Flush glazed extruded aluminum interior window assembly; fully integrated and sealed into wall construction with manufacturers high strength finishing compound.
b. Finish: Clear anodized, corrosion resistant.
c. Size: Custom.
d. Glazing: 5/16 (8mm) inch tempered glass.

1) Single glazed.
2) Double glazed.

B. Wall and Ceiling Panel Accessories:

1. Splines: Aluminum.
2. Battens: Solid engineered resin/glass matrix, same color as composite panels.
3. Wall Base:

a. Solid engineered resin/glass matrix, same color as composite panels.
b. Surface mounted galvanized termination strip.
c. Surface mounted stainless steel termination strip.

4. Attachment Screws: Coated steel or stainless steel screws of length and type as determined by manufacturer to support composite panels.
5. Mastic Adhesive: Xtrabond 9500 – white.
6. Tape Adhesive: 3M – VHB #4959 - thickness 120 mils x 1” (25mm) width
7. Finishing Compound Edge Tape – 3M - # 335 Pink – Polyester/Rubber 1.6 mils x 3/4” (19mm) width.
8. Finishing Compound: Arcoplast Sealant and Finishing Compound A-1010

a. Description: A two-component, 1:1 mix, non-sag, non-porous, non-yellowing, high-gloss, odor-free, solvent-free structural adhesive.
b. Solids: 100 percent.
c. Color: Bright white.
d. FDA Approved: Determination of Extractives Residue according to US FDA 21 CFR 177.2600 Arcoplast finishing compound/sealant.
e. NSF Approved: Registration #148103.

PART 3 - EXECUTION

3.1 TRAINING AND CERTIFICATION

A. Only manufacturer trained and certified specialty applicators shall be considered for the construction of High Containment Environments as well as BSL-3, BSL-3Ag, and BSL-4 facilities.

1. Minimum Applicator requirements:

a. Minimum 2 years experience in construction of High Containment facilities.
b. Familiar with construction guidelines pertaining to Bio-Safety in Microbiological and Biomedical Laboratories established by NIH (National Institute of Health), CDC (Center of Disease Control, NAID (National Institute of Allergy and Infectious Disease).
c. Accredited by manufacturer on application of fiberglass reinforced polymer for high containment establishments.

3.2 EXAMINATION

A. Examine areas to receive composite wall and ceiling panels. Notify Architect of conditions that would adversely affect installation or subsequent use.

B. Ensure other work to be performed behind composite panels is complete before starting installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 INSTALLATION

A. Substrate compatibility and surface adhesion for a large variation of metals, plastics, and glass fiber composite materials is critical for a high performance seal capable of meeting BSL-3, ABSL-3 and BSL-4 compliance.

1. Install composite wall and ceiling panels, accessories, and finish accessories in accordance with manufacturer's written instructions.
2. When substrate compatibility and surface adhesion is doubtful, conduct physical bond test to determine best surface preparation, adhesive primer and adhesive product to use and submit recommendations to owner/contractor for approval.

B. Lay out panels to minimize joints and to provide balanced borders at room perimeter. Use full and uncut panels where possible.

C. Field cut panels as necessary in accordance with manufacturer's instructions.

D. Apply mastic or tape adhesive to furring, steel studs, or existing substrate in accordance with manufacturer’s instructions.

E. Screw panels into galvanized steel studs with attachment screws below floor base line and above ceiling line to hide exposed fasteners.

F. Install panels plumb, level, square, and in proper alignment.

G. Cover panel joints with finishing compound for flush joints.

H. Finishing Compound: Clean floor, walls, and ceiling areas thoroughly, seal and quarantine area prior to application. Prepare surfaces and apply finishing compound in accordance with manufacturer's instructions.

I. Finish wall-to-wall and wall-to-ceiling junctions with 1/2-inch radius joints using finishing compound.

J. Wall Base: Finish wall-to-floor junctions with 1/2-inch radius joints using finishing compound prior to installing wall base before application of floor finish. Set in mastic in accordance with mastic manufacturer's instructions.

K. Seamless Floor Application: Sand panels lightly to remove gloss from surface finish ensuring proper bond. If termination bars/strips are to be used for wall-to-floor base termination, install the bars/strips with VHB tape and avoid mechanical fasteners.

L. Seal joints, openings, and penetrations in accordance with manufacturer's instructions and shop drawings.

M. Sealants: Apply sealants in accordance with sealant manufacturer's instructions and shop drawings.

N. Apply gel coat putty over countersunk fasteners and penetrations in accordance with manufacturer's instructions.

O. Repair minor damages to composite panel finish in accordance with manufacturer's instructions and as approved by Architect.

P. Remove and replace damaged components that cannot be successfully repaired as determined by Architect.

3.4 CLEANING

A. Remove temporary protective film at doorways, windows, equipment and accessories.

B. Clean composite panels promptly after installation in accordance with manufacturer's instructions.

C. Do not use harsh cleaning materials or methods that would damage finish.

3.5 PROTECTION

A. Protect installed composite wall and ceiling panels from damage.

B. Allow 24 hours curing time before pressure wash down sanitation procedures.

3.6 COMMISIONING

A. Manufacturer shall have representative present at time of Commissioning Testing.

1. Provide manufacturer 10 day notice prior to the scheduled testing.

END OF SECTION 066200 (06 62 00)