

Formglas[®] **GFRG**

SECTION 09 27 13

GLASS FIBER REINFORCED GYPSUM FABRICATIONS

PART 1 - GENERAL

1.1 SUMMARY

- A. This section includes furnishing all materials, labor, equipment, and related services necessary to supply and install molded glass fiber reinforced gypsum (GFRG) parts as indicated in the contract documents, and in compliance with applicable codes.

1.2 RELATED SECTIONS

- A. Section 06 10 00 Rough Carpentry - for blocking, nailers, shims, and carpentry supporting glass fiber reinforced gypsum fabrications.
- B. Section 09 22 00 Supports for Plaster and Gypsum Board - for support, blocking, and bracing supporting glass fiber reinforced gypsum fabrications.
- C. Section 09 90 00 Painting and Coating.

1.3 REFERENCES

- A. ASTM International (ASTM)
 - 1. C1381 Standard Specification for Molded Glass Fiber Reinforced Gypsum Parts.
 - 2. C1467 Standard Specification for the Installation of Molded Glass Fiber Reinforced Gypsum Parts.
 - 3. C1355 Standard Specification of Glass Fiber Reinforced Gypsum Composites.
 - 4. C754 Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products.
 - 5. C1007 Specification for Installation of Load Bearing (Transverse and Axial) Steel Studs and Related Accessories.
 - 6. C840 Specification for Application and Finishing of Gypsum Board.

1.4 ACTION SUBMITTALS

- A. Product Data: Submit product data sheets for each specified product.

- B. Past Projects: Submit a minimum of 3 previously completed installations of similar materials and complexity. Include contact name, e-mail address and phone number for each project.
- C. Shop Drawings: Submit drawings for approval showing plans, sections, details, joint treatment, reinforcing, fastening devices and the relation of the GFRG parts to the surrounding construction.
- D. Samples: Submit a minimum of 3 flat samples of GFRG for use by the finishing contractor for paint selection.

1.5 QUALITY ASSURANCE

- A. GFRG Parts and Installation to conform to ASTM Standards governing Molded Glass Fiber Reinforced Gypsum Parts, namely: C1355; C1381; and, C1467 including physical properties and tolerances. See 1.3 References.
- B. Manufacturer Qualifications:
 - a. Manufacturer shall have a minimum of 10 years' experience having successfully supplied GFRG parts for other projects similar in scope and complexity for the work of this Contract.
 - b. Manufacturer shall have a minimum of 10 years' experience using 3D modelling software and CNC machines for the creation of master patterns used to make molds for fabricated GFRG components.
- C. Installer Qualifications: Installer shall have a minimum of 5 years' experience having successfully installed GFRG parts for other projects similar in scope and complexity for the work of this Contract.
- D. The Alpha gypsum cement used to make the GFRG parts is to be mined and processed in the USA with a purity of not less than 90% in accordance to ASTM C1355. Provide a Manufacturer's Certification of Raw Materials.
- E. Substrates to accept GFRG parts shall be installed straight and true within 1/8 in. in 8 linear ft. (3mm in 2500mm) in accordance to ASTM C1467 and shall be free of obstructions and interference that prohibits the correct alignment and attachment of the GFRG parts.

1.6 DELIVERY, STORAGE AND HANDLING

- A. GFRG parts shall be kept clean and dry and stored to prevent distortion, warping, and other physical damage in accordance with the manufacturer's recommendations.

1.7 PROJECT CONDITIONS

- A. Environmental Limitations: Do not deliver or install GFRG parts until building is enclosed and weatherproof, wet work is complete, and the HVAC system maintains temperature and humidity at normal occupancy levels.
- B. Acclimatize GFRG parts for a minimum of 48 hours to the ambient temperature and humidity levels of spaces in which they are to be installed.

1.8 WARRANTY

- A. Manufacturer Warranty: Provide manufacturer's standard product warranty.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A. Formglas Products Ltd. – Tel: +1.416.635.8030 | +1.866.635.8030
Contact your local Formglas representative – www.formglas.com/contact
or send requests for quotations directly to estimating@formglas.com

2.2 GLASS FIBER REINFORCED GYPSUM (GFRG) PARTS

- A. Fabrications: Molded GFRG parts made in accordance with samples, shop drawings and with ASTM C1381 Standard for Molded Glass Fiber Reinforced Gypsum Parts.
- B. Materials: Molded GFRG parts to be made in accordance with ASTM C1355 Standard for Glass Fiber Reinforced Gypsum Composites.
- C. Embedments: GFRG parts to have typical embedments and reinforcement of galvanized steel or wood, if required, for the purposes of suspension, attachment and stiffness.
- D. Molded GFRG units to be ready for primer for typical flat paint finishes.
- E. GFRG parts subject to critical lighting or scheduled to receive semi-gloss decoration shall be prepared as a Level 5 finish which may require skim coats, filling, and sanding to hide imperfections inherent in GFRG, in accordance to ASTM Standards C840 and C1467.
- F. Manufacturer, upon request, to produce copies of laboratory test results verifying that its material meets 2.3 A and B.

2.3 PHYSICAL PROPERTIES

- A. Molded Glass Fiber Reinforced Gypsum Parts to meet the mechanical properties specified in section 5.2 of ASTM Standard C1355:
 - (1) Flexural Strength in accordance to ASTM C947;
 - (2) Impact Resistance in accordance to ASTM D256;
 - (3) Hardness in accordance to ASTM D2583;
 - (4) Coefficient of Linear Thermal Expansion in accordance to ASTM D696;
 - (5) Humidified Deflection in accordance to ASTM C473;
 - (6) Surface Burning Characteristics in accordance to ASTM E84;
 - (7) Behavior at 750° C in accordance to ASTM E136;
 - (8) Nail Pull Resistance in accordance to ASTM C473.

- B. Matrix: Alpha Gypsum Cement
 - Shell thickness: 3/16" (4.5 mm) nominal
 - Edge thickness: 3/4" (19 mm) typical
 - Density: ~105 lb/ft³ (1675 kg/m³)
 - Weight: 1½ - 2 lb/ft² (7-10 kg/m²)
 - Glass Fiber: 5% typical
 - Embedments: Galvanized steel or wood, if required
 - Color: Unfinished, white to off-white
 - Surface: Smooth, unless otherwise specified

ASTM C1355 - Specified Tests for Glass Fiber Reinforced Gypsum Composites
Flexural strength:

Average Flexural Yield Strength (ASTM C947): 1,875 psi (13 MPa)
Average Flexural Ultimate Strength (ASTM C947): 4,700 psi (32 MPa)
Impact Resistance (ASTM D256): 6.5 ft·lbf/in (347 J/m)
Hardness (ASTM D2583): 60 Barcol
Coefficient of Linear Thermal Expansion (ASTM D696): 5.5×10^{-6} in/in/°F
(9.9×10^{-6} mm/mm/°C)
Humidified Deflection (ASTM C473): 1/8" (3mm)
Surface Burning Characteristics (ASTM E84):
Flame Spread: 0
Smoke Development: 0
Behavior at 750°C (ASTM E136): Pass
Nail Pull Resistance (ASTM C473): 176 lbf (782 N)

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Site Conditions: Verify the conditions for compliance with the requirements including environmental conditions, installation tolerances and other conditions affecting the installation and performance of GFRG parts. Any unsatisfactory conditions to be corrected prior to installation.
- B. Field Dimensions: Field dimensions are to be verified including those not shown on the drawings. Any discrepancies are to be brought to the attention of the Architect with resolutions to the discrepancies to be mutually agreed upon by all parties involved. Details of any changes required must be incorporated into the manufacturer's shop drawings prior to commencing the manufacture of the GFRG parts.

3.2 PREPARATION

- A. Substrate: Substrates to accept GFRG parts, provided by others, shall be installed straight and true within 1/8 in. in 8 ft. (3mm in 2500mm) and shall be free of obstructions and interference that prohibits correct attachment of GFRG parts.
- B. Metal framing members, provided by others, shall be of the proper size and design for the intended use and shall be sufficient to properly support the installed GFRG parts. Metal framing members shall be installed in accordance with ASTM Standards C754 or C1007 as required.

3.3 INSTALLATION

- A. Comply with ASTM C1467 Standard for the Installation of Molded Glass Fiber Reinforced Gypsum Parts.
- B. It is the Installer's responsibility to verify scope and to order the correct quantities of parts (including a waste allowance).
- C. Supply and install all shims and brackets required for work in this section and to ensure a solid and secure installation of GFRG parts.
- D. Position GFRG parts carefully into place and align with adjacent parts and materials in accordance to the drawings. Attach GFRG parts to substrates and framing with fastening devices as specified by the GFRG manufacturer. Use concealed shims as required and countersink screws below the surrounding surface.

- E. Where GFRG parts are suspended, use the suspension points indicated on the shop drawings as a minimum requirement and use additional support(s) if required.
- F. Install control joints between GFRG parts as indicated and as required by the architect or noted in shop drawings, if applicable.
- G. Use joint-treatment materials to finish GFRG parts and assemblies to produce surfaces ready to receive primers and paint finishes as detailed. Note: Unfinished GFRG parts may exhibit slight imperfections, normally hidden by a textured finished. To obtain satisfactory results with smooth finishes, filling and sanding will be required to hide imperfections inherent in GFRG.
- H. Countersunk fasteners and damage to be patched to match the GFRG part's texture.

3.4 FINISHING OF GFRG PARTS

- A. Finishing of the GFRG parts to be carried out by the painting contractor. Proper sealing of the finished GFRG assemblies must be provided to avoid joint tape read through. For more information, consult the ASTM C840 – see 1.3 References.

END OF SECTION