
G.R.G. Specification Sheet

2006 Guide to Specifications on Standard
Glass Reinforced Gypsum Products

SECTION _____
GLASS REINFORCED GYPSUM

PART 1 GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and General Provisions of the contract, including General and Supplementary Conditions and Division - 1 Specification Sections apply to work of this section.

1.02 SCOPE OF WORK

- A. Extent of Reinforced Fabrications is as indicated on the Architectural drawings.
- B. Work Included:
 - 1. Domes 2000, Inc. shall provide all labor, materials, equipment and related services required for the fabrication of decorative ceiling treatments, various dome shapes, profiles and moldings as shown in the contract documents and indicated as G.R.G.
 - 2. Installer (by others) shall provide all labor, materials, equipment and related services required for the complete erection and finishing of all G.R.G. shapes as shown in the contract documents and in conformance with the manufacturer's installation procedures, including:
 - a. Internal connections to structural framing, including brackets, braces, and shims.
 - b. Anchorage's, suspension systems, welding, adhesive and sealant.
 - c. Joint preparation, tape and bedding, patching and fastener concealment.
 - d. Finishing and preparation of shapes ready for painting.
- C. Related work in other sections:
 - 1. Steel framing and furring members.
 - 2. Wood Framing.
 - 3. Acoustical Ceilings.
 - 4. Paint and applied finishes.

5. Sealant.

D. Design responsibility:

1. Manufacturer will design individual pieces to conform to the design and details contained in the contract drawings. Any desired changes shall be noted and submitted with shop drawings.
2. Installer is to note potential problems with installation as designed and any proposed changes will be submitted for review.
3. Installation will be as shown in approved shop drawings.

1.03 QUALITY ASSURANCE

A. Manufacturer's qualifications:

1. Approved manufacturer: Prefabricated G.R.G. shapes shall be as manufactured by Domes 2000, Inc., 510 Birch Court, Colton, CA 92324, (909) 426-0945
2. Alternative manufacturer: Other manufacturer as approved by the Architect.
3. Substitutions:
 - a. Alternate products must be submitted for approval.

- B. Erector qualifications: Erector shall have complete at least five (5) projects comparable in size and scope to this contract. The erector must demonstrate the ability to erect and finish the material in a timely and efficient manner.

1.04 SUBMITTALS

- A. Samples: The manufacturer shall submit (if required) a minimum of three (3) 6" x 6" flat samples with a representative finish as expected.
- B. Shop Drawings: The manufacturer shall submit complete shop drawings fully detailing each piece and indicating attachment methods, joint treatments, supports, suspension systems and location of shapes. Drawings shall indicate the relation of G.R.G. shapes to any item affecting the installation of the shapes. All openings will be field cut as required unless noted on the approved shop drawings.
- C. Manufacturer's installation procedures: The manufacturer shall submit copies of the manufacturer's literature, describing recommended joint treatment, patching, adhesives, fasteners and fastener concealment procedures. Available @ www.domes2000.com

- D. Test Reports: The manufacturer shall submit test reports by testing laboratories showing compliance with data contained in this document, as deemed necessary.
- E. The manufacturer shall submit a manufacturer's certificate describing the composition of the G.R.G. material, gypsum type, G.R.G. content, glass type, sand or aggregated type and typical properties of the material. Chopped glass fiber of 1" or greater is to be used only on detail work requiring ease of placement. Combustible materials contained within shapes will not be acceptable.
- F. Mock-ups: N/A.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Glass Reinforced Gypsum:
 - 1. Gypsum will be Hydrocal FGR Gypsum cement. Gypsum for this project should be from the same source and if possible, from the same batch throughout.
 - 2. Glass fiber reinforced to be long strand of 2" or greater, continuous filament, glass mat laminated individually in the F.G.R. mix in sufficient quantity to achieve proper thickness.
 - 3. N/A
- B. Embeds, inserts and any other material integrated into the G.R.G. shapes with the exception of temporary braces and packing material, will be non combustible. Insert should not be brittle materials or metals incompatible with attachments as detailed. All metal shall be zinc coated, cadmium plated, galvanized or stainless steel.
- C. Miscellaneous materials: (field application, by others)
 - 1. Joint treatment materials will be as recommended by the manufacturer. (Drywall Compounds)

2.02 FABRICATION

- A. Molds: Are to be fabricated to form proper shapes and sizes as indicated. They shall be without warp or distortion and; shall be substantial enough to form pieces required without deformation in the manufacturing process.
- B. Hand lamination: Mix gypsum and other ingredients as required for specified material characteristics. Laminate gypsum matrix and layers of glass mat, fully saturating the glass and conforming to the shape of the mold.
- C. Curing: G.R.G. shall be handled and stored under controlled conditions for a sufficient period of time to ensure product stability.
- D. Identification: Mark each piece as indicated in shop drawings on an unexpected surface (pending).
- E. Features of G.R.G.
- **Fire resistant**-- Gypsum is a mineral. It will not burn. Laboratory fire tests conducted on varying thickness of G.R.G. (with 5% to 6% glass fiber content and without face coating) substantiate this non-combustibility, also show no appreciable fuel contribution and zero flame spread. The temperature of G.R.G. will not exceed 212 degrees F. until all chemically combined water is removed.
 - **Safety in handling**-- Gypsum does not emit toxic gases when subjected to heat as some materials do. Gypsum cement is non-toxic, non-allergenic and odorless. It does not attract or support vermin and when dry does not support mold, fungus, or bacteria. Non-corrosive to most non-ferrous materials and non-combustible, it requires only reasonable handling precautions. With a pH of 6.5 to 8.0, it has a virtually neutral reaction.
 - **Lightweight but strong**--G.R.G. panels 1/10 in. thick weigh only 9/10 lb. per sq. ft. Test results show a flexural strength of 4,000 psi, flexural modulus 2.1-2.2 10⁵ psi, impact strength 8.0 to 8.8 psi. (Engineers should use 2-3 lbs./s.f. for calc's.)
 - **Versatile paintability**--G.R.G. has a surface that is easily decorated with most oil-base, alkyd or latex paints, and most stains, lacquers, varnishes or shellacs.
 - **Controllable setting time**-- Easily controlled through the use of simple non-toxic accelerators or retarders, thus creating working time range of 10 min. to 2 hours. Setting time is easily reproducible from batch to batch.
 - **Controllable setting expansion**-- G.R.G. expands during the setting action. Expansion proceeds simultaneously with the setting process and is complete upon final set -- normally about one hour after application. Maximum expansion is 0.320%. This expansion has numerous practical benefits, such as fidelity of

detail, release of casts from drafted molds, and reproducible dimensional accuracy.

- **Dimensional stability** -- G.R.G. are unaffected by normal changes in temperature and humidity.
- **Dependable results** -- G.R.G. have a shelf life of three to six months and are buffered to a great degree against user variables. With adherence to a few simple procedural controls in the plant, good results are obtainable.

F. Material characteristics: G.R.G. to meet or exceed the following standards:

Matrix	Hydrocal FGR Gypsum Cement
Consistency	25-30 cc.
Glass Fiber	5-6% by weight Type E chopped to 2" length (standard)
Flexural strength	3,200 to 4,000(psi)
Modulus of elasticity:flexural	2.1-2.2 10 ⁵ psi
Ultimate tensile strength	1,200 to 1,400(psi)
Modulus of elasticity:tension	2.7 x 10 ⁶ to 3.8 x 10 ⁶ (psi)
Impact strength	8.0 to 8.8 ft. lb./in. ²
Thermal conductivity	4.0 to 4.2 (Btu/in./hr/ft ² /deg F)
Specific heat	0.253 Btu/lb./deg F
Flammability	Zero flame spread; Zero smoke contribution.
Rockwell hardness	M72
Dielectric strength	Same as air when dry; Conductive when wet
Density (dry)	103-112 lb./ft. ³
Coefficient of thermal expansion	8.3 x 10 ⁻⁶ (in./in./deg F)
Coverage	100 lb. of HYDROCAL FGR Gypsum Cement 125 ft. ² - 1/10" thick

PART 3 EXECUTION

3.01 DELIVERY, STORAGE, AND HANDLING

A. Delivery and Handling

1. All pieces are to be handled, loaded, and shipped in a manner consistent with their shape, weight and size.

2. Lift and support pieces only at points indicated for attachment on approved drawings.
3. Support pieces during shipment on non-staining, shock absorbing material.
4. Place non-staining, resilient material between pieces.
5. Protect pieces in transit from dirt and moisture.

B. Storage:

1. Material to be stored inside and under climate controlled conditions.
2. Material to be stored in an upright position on a flat, smooth and level surface.
3. Cover and protect pieces from excessive dirt, moisture, surface damage or other job site hazards.
4. Maintain a consistent temperature and humidity level throughout storage, installation and finishing.

3.02 INSPECTION

- A. The contractor shall be responsible for inspecting and verifying detail for correct installation.
- B. The installer shall verify all marks and check job site condition for clearance, working space and all marks provided before commencement of installation. Installer will also inspect all pieces prior to installation. Installer will be responsible for repairing all installed pieces, except manufacturing defects. All discrepancies affecting the installation of the G.R.G. shapes will be brought to the attention of the Architect and resolved before installation begins.
- C. The Contractor will provide a sufficient space for unloading and transport of pieces as required. If crating/packaging shows signs of damage from transportation service, customer is to make notes on bill of lading, describing conditions of crate and or possible damage. Photos are required for all claims.

3.03 ERECTION

- A. Safety: The installer is responsible for handling and installing the G.R.G. material in a safe manner. They shall report any unsafe conditions immediately to the Contractor.
- B. The installer shall use experienced workers to install the G.R.G. shapes. Material shall be installed level and plumb and as shown in the approved shop drawings. Joints shall be properly aligned and spaced as required to prevent overall dimensional error. All

pieces shall be securely anchored and joints finished as shown in the approved shop drawings. (typical details available @ www.domes2000.com)

- C. Finishing: Finish joints as shown. Sand units smooth and finish surface as required. Coat all pieces to prevent water absorption with a water vapor, permeable sealant compatible with finished coating. Patch any surface defects and prepare surfaces for work of other trades.
- D. The manufacturer shall repair or replace defective pieces. Repair or replacements will be subject to approval by the Architect.
- E. The installer shall protect the G.R.G. shapes from damage by other trades during construction.
- F. After erection, all damage and repair will be the responsibility of the Contractor.

PART 4 WARRANTY

4.01 TERMS & CONDITIONS-WARRANTY (California Only)

Available upon request

Domes 2000, Inc. warrants its product upon the following conditions against defects in material and workmanship for a period of one year from the date of delivery. In the event that a claim is made under this warranty, Domes 2000, Inc. has the right to inspect or have its Agent inspect the parts and determine, in its discretion, that the parts supplied are defective. Domes 2000, Inc. will repair, or if need be, replace said defective parts.

Domes 2000, Inc. shall have no liability to any person, firm or corporation whatsoever for incidental or consequential damages such as, but not limited to, labor, finishing, parts damaged by installation, lost profits, lost sales or the like. No Purchaser may make any chargeback without the expressed written consent of Domes 2000, Inc. The foregoing warranty is exclusive and in lieu of all warranties, whether written, oral or implied (including any warranty of merchantability or fitness for purpose).