

## Technical & Installation Data Sheet

### PART 1: SUMMARY

GRC is a composite material made using Portland cement, sand, aggregate and glass fiber that has good flexural strength properties. Parts are factory molded in a hand lay-up process to make architectural elements in a variety of shapes, patterns, textures and choices of color; or, are available unfinished for on-site painting. After de-molding, unless specified as paint ready, the exposed face of the parts is finely sandblasted to impart a uniform surface finish. GRC parts have a nominal shell thickness of 19 mm with perimeter edges increased to 25 mm to provide added strength does not incorporate a factory attached steel panel frame for support.

### PART 2: PERFORMANCES

#### 2.1 SHAPE

The items are to be formed in GRC to achieve the design intent as indicated in the Architect's drawings and/or the approved proposed design as submitted by the contractor.

#### 2.2 WATER PENETRATION

Panels shall be resistant to water penetration and no dampness shall be visible on the inner face of the panel.

### PART 3 GRC PROPERTIES

The GRC shall be the following properties on completion of cure; the dry density of the GRC should not be less than 1700 kg/m<sup>3</sup>

#### 3.1 COMPRESSIVE STRENGTH TESTED TO ASTM C 109/C 109M : 2002

- A. Maximum Load: - 53269.7 N
- B. Compressive Strength: - 21.31 N/mm<sup>2</sup>

#### 3.2 FLEXURAL STRENGTH TESTED TO ASTM C 580 – 98

- A. Flexural Strength: - 33.8 N/mm<sup>2</sup>
- B. Modulus of Elasticity: - 6172.8 MPa

#### 3.3 CHARPY IMPACT STRENGTH - 12.0 KJ/M<sup>2</sup> (Tested to ASTM D6110: 1997)

#### 3.4 COEFFICIENT OF THERMAL EXPANSION 10.5 μM/M°C (Tested to ASTM E831: 2000)

#### 3.5 THERMAL CONDUCTIVITY 0.12258 W/M°K (Tested to ASTM C518: 1991)

## PART 4 MATERIALS

### 4.1 CEMENT

- The cement shall be Ordinary Portland Cement (OPC).

### 4.2 GLASSFIBRE

- The glassfibre use shall be high-quality Alkaline-Resistant glassfibre which is designed to reinforce cementitious and other alkaline matrices.

### 4.3 AGGREGATE

- Sand shall be washed and free from soluble salts.
- Maximum particle size shall be 1mm.

### 4.4 COLORING

- GRC could take any color using pigments (iron oxide) in the mix.
- Guaranteed against color fading or peeling.
- Physical and Mechanical properties

## PHYSICAL AND MECHANICAL PROPERTIES

MATRIX	Portland cement, sand, and polymer	
FINISH	Custom pigment color matching available in case using white cement. On-site painting	
SURFACE	Lightly sandblasted or smooth if paint ready	
DENSITY	134 lbs/ft. <sup>3</sup>	2145 kg/m <sup>3</sup>
WEIGHT	6.5-7.5 lbs/ft. <sup>2</sup> 32-37 kg/m <sup>2*</sup>	
SHELL THICKNESS	5/8"	16 mm nominal**
EDGE THICKNESS	5/8"	16 mm minimum
GLASS FIBER	4% minimum	
MAX. LENGTH MOLDINGS	4'	1.2 m
MAX. SIZE VENEER PANELS	48" x 36"	1200 x 900 mm
MAX. SIZE MOLDED PARTS	15 ft <sup>2</sup>	1.4 m <sup>2</sup>

## MANUFACTURING TOLERANCES

DIMENSIONAL (All Directions)	± 3/16"	5mm
THICKNESS	± 1/8"	3mm
VARIATION FROM SQUARE	± 1/8"	3mm
BOWING, OUT OF PLANE	1/8"/ft	3mm / 300mm

\* Typical weights – parts with deep surface relief, etc. may weigh more. Submit drawings for a more accurate estimate.

\*\* Subject to manufacturing tolerances. Weight and measurement conversions may be rounded.

## **PART 5 PROTECTION**

Protect GRC material (moldings) and Frame work (if any) from damage and deterioration during remainder of construction period

## **PART 6 INSTALLATION**

### **GENERAL**

- GRC parts to be installed as indicated on the approved shop drawings, instructions and the contract documents.
- Brackets and shims to be used for the installation and proper alignment of the GRC parts with adjacent parts and materials. Part thicknesses may vary.
- GRC parts are to be attached to the framing members or substrate using corrosion resistant screws, bolts or other fasteners as shown on the shop drawings. Additional bracing, fastening points etc. not shown on the drawings, may be required to ensure a proper installation.

### **CUTTING**

- When cutting parts is required, use the most suitable cutting method listed below. Always wear goggles and a dust mask.
- A miter or table saw with diamond blade for masonry use dry cut only.

### **ATTACHMENT**

GRC parts are to be installed with concealed fastening methods. Face fastening will always be visible and should be avoided. Typically, metal mounting plates are factory attached to the backs of panels which extend marginally beyond the part edges into joint spaces where the screws will subsequently be concealed with caulked joints. In some instances, where fastening is along a top edge of a panel, flashing materials can conceal face fasteners.

### **JOINT TREATMENTS**

- Joints to be caulked
- Spacers to be used (min 3/16") to maintain a uniform gap and apply masking tape on each side of the joint.