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# GLASSFIBRE REINFORCED GYPSUM (GRG) TECHNICAL SPECIFICATION



**PLASTERCEIL INDUSTRIES PTE LTD**

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## **GLASSFIBRE REINFORCED GYPSUM (GRG)**

### **PART 1 INTRODUCTION**

#### **1.1 SPECIALIST CONTRACTOR**

The work specified in this section is to be undertaken by a Manufacturer who has five years and above experience in the GRG industry, which includes the production of architectural panels (or other products for which this specification is being used). With his tender, the contractor shall submit to the construction manager written evidence indicating his capability of producing panels of a reliable and consistent quality.

#### **1.2 GENERAL**

Materials used for making the GRG unit shall generally comply with relevant British and Australian Standards and Codes. Any reference to a British Standard shall mean that current at the time of going to tender.

Where materials are not fully covered by this specification or alternative materials are offered, the Contractor shall forward to the Construction Manager prior to commencing the work, details of those he proposed to use together with supporting evidence indicating that the finished product will be capable of meeting the performance requirements of this specification.

#### **1.3 ALKALI-RESISTANCE GLASSFIBRE**

Glassfibre shall be an alkali-resistant, continuous filament fibre development and formulated specifically to have high strength retention in Ordinary Portland Cement environments.

The glass fibre shall have a minimum ZrO<sub>2</sub> content of 16% by weight, in accordance with internationally-recognized standards.

The producer shall provide certification from the glassfibre manufacturer to show that the glass fibre conforms to these requirements, has a history of successful use in similar matrices, and is manufactured under an international- recognized Quality Management system.

#### **1.4 GYPSUM**

The gypsum shall be high grade Alpha gypsum, supplied by a manufacturer of assessed capability. It shall not be porous nor contain Abesto or harmful to body.

Gypsum shall be correctly stored and kept by dry to avoid deterioration.

#### **1.5 WATER**

Water shall be free from deleterious matter that may interfere with the colour setting, or strength of the Gypsum.



## 1.6 MOULD-RELEASE AGENT

The mould-release agent shall be selected by the manufacturer. This should be compatible with the surface finish required for the product. Any residue shall be removed from the finished product so that this does not interfere with joint sealants or applied finishes which may be used.

## PART 2 WORKMANSHIP

### 2.1 WEIGHING AND BATCHING

Dry ingredients shall be batched by weight using calibrated weighing equipment capable of an accuracy of  $\pm 2\%$  of the stated batch weight. Liquids should be weighed, volume-batched or automatically dispensed. The producer must demonstrate that the method employed will give an accuracy of  $\pm 2\%$ .

### 2.2 APPLICATION

Application shall be by spraying, using purpose-built equipment which allows the simultaneous deposition and uniform mixing of the glassfibre and gypsum matrix. Nevertheless, manual means shall also be applicable.

The glassfibre and gypsum shall be metered to the spray head at rates to achieve the desired mix proportion and glass content. These shall be checked for each spray pump at least once per day and prior to commencing spray production after each stoppage. Distribution of fibre in the mix shall be controlled by the operator in such a way as to be as uniform as possible.

Cleanliness of equipment and working areas shall be maintained at all times.

### 2.3 AREAS OF APPLICATION

Areas where GRG board is highly suitable for use are:

- a) Dry lining to corridors, public access areas
- b) Dry lining to pump room or the AHU room
- c) Dry lining for pipes / cables wire cover
- d) Forms an excellent substrate for ceramic tiles
- e) Areas subjected to high humidity and high level of dampness (e.g. Shower rooms, bathrooms, sauna rooms, etc.)
- f) Ceiling applications



## 2.4 SHOP DRAWINGS

Prior to commencing manufacturing work, the architect / designer / manufacturer shall submit for approval detailed shop drawings showing the following information :

- ° layout (sectional plan and elevation) of complete wall paneling;
- ° full-size section of typical panel and support members;
- ° method of assembly and supports and fixing to the existing structure and provision to withstand imposed stresses;
- ° method of installation, caulking, flashing and provision for vertical and horizontal expansion;
- ° junction and trim to adjoining surfaces; and
- ° fittings and accessories.

The submission of shop drawings shall be supported by engineering design computations to show that cladding and supports comply with the design criteria specified.

## 2.5 IDENTIFICATION OF ELEMENTS - PLASTEC

All panels shall be identified individually to indicate the panel type and date of manufacture. At the time of preparation of shop drawings the manufacturer shall indicate his required order of delivery.

## 2.6 HANDLING AND STORAGE

Raw materials: All raw materials, except water, shall be delivered and stored in their original unopened packages in an enclosed shelter providing protection from damage and exposure to the elements. Damaged or delivered materials shall be moved from the premises.

Finished materials:

1. Deliver materials in original unopened containers, clearly labeled with manufacturer's name, item description, specification number, type and class as applicable.
2. Storage time on the job site should be as short as possible, and environmental conditions should be as near as possible to those specified for occupancy. Excess humidity during storage can cause expansion of the installation. Chemical changes in the reinforcement mat and coating can be aggravated by excess humidity and cause discoloration when storing even unopened containers. Damaged or deteriorated materials shall be removed from the premises. Immediately before installation, store items at a location where temperature and humidity conditions duplicate ambient during installation and anticipated for occupancy.
3. Installation conditions should be at or near those under standard occupancy conditions of temperature and humidity 60-85°F (16-29°C), no more than 70% relative humidity.
4. Handle in such a manner as to ensure against racking distortion or physical damage of any kind.



**2.7 TEST REQUIREMENTS**

Relevant authorities of varies required testing.

**PART 3 COMPLIANCE**

**i) Glass Content**

The glass content shall not vary from the specific amount by more than  $\pm 20\%$ .

**ii) Dry Density**

The dry density of the GRG shall be approx. 1660kg/m<sup>3</sup>

**iii) Strength Performance**

Compressive Strength-	23.7N/mm <sup>2</sup>	(ASTM C109)
Impact Strength-	45.4KJ/m <sup>2</sup>	(ASTM D6110 : 1997)
Tensile Strength-	14.2 KN	(ASTM D1037 : 1999)
Flexural Strength-	28.8M/mm <sup>2</sup>	(ASTM C580-98)
Modulus of elasticity, Tangent-	7522.1 MPA	(ASTM C580-98)
Rockwell Hardness 'M' Scale value-	M52	('M' Scale Value)

**iv) Water Absorption**

The water absorption at 20 + 2 C for 2 hour - 0.3%

**v) Thermal Performance**

Plastec GRG has a very low thermal conductivity of 0.0918w/m<sup>2</sup>k  
Coefficient of Thermal Expansion at 6.2 x 10<sup>-6</sup> inch/inch F

**vi) Fire Performance**

Non-combustible (BS 476 Part 4 :1970)

**vii) Non-Compliance**

In the event of non-compliance, the action to be taken should be agreed between the manufacturer and the client. Due regards should be paid to the technical consequences of the non-compliance and the economic consequences of adopting remedial measures or replacing the rejected products. Account should also be taken of the safety factors incorporated in the design and also the thickness of the GRG produced, compared with the design thickness.



**PART 4                    OTHER ISSUES**

**4.1    RESPONSIBILITY**

The GRG manufacturer will not be responsible for the design of the GRG and their supports. Information provided on the drawings is followed unless special detailing by manufacturer is required to assist the design criteria.

**END OF SECTION**

Reference of information by GRC Industry Group of National Precast Concrete Association Australia and Hydrocal FGR Gypsum Cement, USA



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