

Product & Safety Datasheet

Product Category

Glass Fibre Reinforced Concrete (GRC)

Manufacturing Compliance

Satu Bumi's GRC is manufactured in compliance with the GRCA International's "Specification for the Manufacture, Curing & Testing of Glassfibre Reinforced Concrete (GRC) Products".

Product Overview

Satu Bumi GRC is produced to a "commercial grade" for used in the manufacture of pots, planters, outdoor garden furniture, and commercial street furniture for the commercial landscaping and construction market.

Features

- Includes a 2-year warranty.
- Fire resistant
- Chemical resistant
- Water permeability resistant
- Harsh weather resistant
- Freeze/thaw resistant
- Includes alkaline resistant glass fibre reinforcement which provides high tensile and flexural strength

GRC Mix Design

	Polymer GRC		Non-Polymer GRC
Aggregate/cement ratio	0.5 - 1.5	Aggregate/cement ratio	0.5 - 1.5
Water/cement ratio	0.30 - 0.38	Water/cement ratio	0.30 - 0.38
Glassfibre content (% by weight of total mix)	4.0 - 5.5%	Glassfibre content (% by weight of total mix)	4.0 - 5.5%
Polymer solids content (% by weight of cement)	4-7%	Polymer solids content (% by weight of cement)	0%

Manufacturing Technique

Satu Bumi manufactures all its GRC products by spraying a micro concrete mix onto moulds to form relatively thin sectioned lightweight concrete walls. This micro concrete mix is prepared in a high shear mixer and applied through a special spray gun which incorporates alkaline resistant glass fibre reinforcement at the nozzle. This production method typically produces a higher strength product than that produced from the poured concrete mould technique due to higher glass fibre content, lower water/cement ratio, longer fibre length and more efficient planar fibre orientation. Polymer is normally included in the raw materials mix primarily to speed up the curing process. However, where a higher level of combustibility certification is required, polymer is removed from the raw materials mix and the resulting GRC products are wet cured to control their curing.

Mechanical Properties

Characteristic Type	Satu Bumi Properties	GRCA Requirement
Grade of GRC	18	18
Compressive strength	312.59 (Kg/Cm ²) 31 MPA	Minimum 28 MPA
Characteristic LOP	8.687 (N/mm ²)	Minimum 8 (N/mm ²)
Characteristic MOP	24.197 (N/mm ²)	Minimum 21 (N/mm ²)

Thermal Properties of Polymer GRC

Fire Testing Report – Specific to Satu Bumi Polymer GRC

Satu Bumi's "polymer concrete with glass fibre re-inforcement" has been fire tested: -

- By: - AWTA Limited which is accredited by NATA for compliance with ISO/IEC – Testing.
- For: - Compliance under AS/NZS 1530.3 "Methods for Fire Testing on Building Materials, Components and Structures Part 3: Simultaneous Determination of Ignitability, Flame Propagation, Heat Release and Smoke Release.
- Results: -

Number of specimens tested: 6. Number of specimens ignited: 0		Date Tested: 06/08/2020. Face Tested: Face
	Standard Error	Mean
Ignition time	Nil	Nil min
Flame propagation time	Nil	Nil sec
Heat release integral	Nil	Nil kJ/m ²
Smoke release, log d	0.0569	-2.4421
Optical density, d		0.0038 / metre
Regulatory indices		
Ignitability Index	0	Range 0-20
Spread of Flame Index	0	Range 0-10
Heat Evolved Index	0	Range 0-10
Smoke Developed Index	0-1	Range 0-10

- The Test Report: Is available upon request by email to sales@satubumi.com.au
- **Generic Fire Testing Data provided by the GRCA (UK)** – The following is a summary of fire testing completed in the UK as it generally relates to polymer concrete that conforms with the GRCA Specification for the Manufacture, Curing & Testing of Glassfibre Reinforced Concrete (GRC) Products but was not specifically done on Satu Bumi polymer GRC.
 - Test data from fire tests to EN1182 and EN1716 demonstrate that GRC manufactured with a pure acrylic co-polymer (P grade GRC) generally falls within the permissible range of a Class A1 material according to the criteria set out in Table 1 of EN13501-1:2007+A1:2009. However, some P grade GRC's have been classified as A2. All tests are subject to experimental tolerance. According to the data seen by the GRCA, no sustained flaming has occurred in any test, but some have yielded sufficient smoke to trigger the additional test according to EN13823. In this case, the individual GRC automatically falls within class A2.
 - An A2 material is classified as having “*limited combustibility*” and has “*no significant contribution to fire growth*”. According to the “*Application Criteria*” defined in EN13501, class A2 materials may be used in wall and ceiling application.

Thermal Properties of Non-Polymer GRC

▪ Fire Testing Report – Specific to Satu Bumi Non-Polymer GRC

Satu Bumi's “non-polymer concrete with glass fibre re-inforcement” has been fire tested: -

- By: - The CSIRO which is accredited by NATA for compliance with ISO/IEC – Testing.
- For: - Compliance under AS/NZS 1530.1 “Methods for Fire Testing on Building Materials, Components and Structures Part 3: Simultaneous Determination of Ignitability, Flame Propagation, Heat Release and Smoke Release.
- Results: - “The material is deemed NOT combustible according to the test criteria specified in Clause 3.4 of AS 1530.1-1994.”
- The Certificate of Test: Is available upon request by email to sales@satubumi.com.au

Additional Properties

- Does not include any asbestos
- UV Stable and Weather resistant in accordance with good quality concrete material

Health and Safety

Silica sand is a component raw material in GRC. Therefore, when drilling or cutting GRC you can generate respirable crystalline silica dust and, when inhaled, these particles of silica can irreversibly damage lungs. Therefore, the wearing of appropriate dust masks and the observation of any other relevant safety precautions is strongly recommended when drilling or cutting GRC.

Quality Control Management System

Satu Bumi has been certified to the ISO 9001:2015 standard for the “Manufacturing of Glass Fibre Reinforced Concrete Products (GFRC)” by the internationally recognised BSI Group.

Disclaimer

The data provided in this data sheet was correct at the time of publication. However, it is the responsibility of those using this information to check that this information is current prior to specifying or using Satu Bumi's GRC products.