



## Brick Faced Glass Fibre Reinforced Concrete Grade 18P

### PRODUCT DESCRIPTION

Backing Coat - GRC is a composite material comprising of, cement, fine aggregates, alkali resistant glass fibres, acrylic polymers and admixtures/additives.

Facing Layer – Utilising natural brick facings 16-24mm thick, mechanically and adhesively bonded in the manufacturing process.

Natural Hydraulic Lime pointing mortar further enhances the performance attributes of this modern method of construction.

### SPECIFICATION

In accordance with the recommendations and guidelines stated within “Specification for the Manufacture, Curing and Testing of Glassfibre Reinforced Concrete (GRC) Products” published by of our trade body, The International Glassfibre Reinforced Concrete Association (GRCA) and British Standards referred to in this document.

### APPLICATION

Wide range of applications beyond its most common adopted use for medium and large format panel systems providing lightweight, high impact, total façade rainscreen cladding solutions.

### PERFORMANCE ATTRIBUTES

Grade 18P direct sprayed GRC achieves the highest technical performance of all the GRC grades, providing the highest level of creativity and enabling large format cladding panel sizes up to 10m<sup>2</sup>. GRC is easily moulded, its high strength capabilities enable the design and off-site manufacture, of thin lightweight cladding elements. Available with a wide range of hand-made, extruded, or standard bricks of varying properties and sizes, in addition to mortar joint depth, style and colour options.

### CHARACTERISTIC MECHANICAL PROPERTIES GRADE 18P GRC AT 28 DAYS

(MOR <sub>28</sub> )	18-30 N/mm <sup>2</sup>
(LOP <sub>28</sub> )	5-10 N/mm <sup>2</sup>
(UTS <sub>28</sub> )	8-12 N/mm <sup>2</sup>
(BOP <sub>28</sub> )	4-6 N/mm <sup>2</sup>
Interlaminar Shear	2-4 N/mm <sup>2</sup>
In-Plane Shear	7-12 N/mm <sup>2</sup>
Punching Shear	25-35 N/mm <sup>2</sup>
Charpy Impact Strength	15-25 N/mm <sup>2</sup>
Dry Bulk Density	1800-2100 Kg/m <sup>3</sup>
Water Absorption	8-13%
Apparent Porosity	16-25%

**MOR** - Modulus of Rupture (flexural), the ultimate bending stress obtained from the four point bend test.

**LOP** - Limit of Proportionality (flexural) ie the point at which the stress/strain curve deviates from a straight line.

**UTS** - Ultimate Tensile Strength - Stress at which GRC fails in pure tension.

**BOP** - Bend over point (tensile), namely, the stress at which the stress/strain curve deviates from a straight line variation when a sample of GRC is tested in direct tension.

## **WINTECH Technical report R18467**

Test concludes - "When comparing the performance of GRC Panels with and without brick inlayed into the face. It is clear from the results that the addition of the brick inlay increases the load capacity of the panel."

### **PROPERTIES IN RELATION TO FIRE**

Tests indicate GRC Grade 18P is non-combustible (BS 476-4), achieves fire propagation Class 0 (BS 476-6), surface spread of flame, class 1, zero spread (BS 476-7), providing 4 hours integrity. Brick faced GRC achieves A1 Classification for reaction to fire performance in accordance with BS EN 13501-1:2007+A1:2009.

### **QUALITY AND APPEARANCE**

Created from natural minerals, brick faced glass fibre reinforced concrete panels replicate traditional brickwork to a standard of that produced by a skilled mason. Prior to construction a sample panel of a size that adequately represents the natural variation characteristics of the selected brick(s) should be manufactured. The panel should also demonstrate the intended bond, joint profile and mortar colour. Publicly Available Specification PAS 70, published by the British Standards Institute, identifies the parameters that enable the manner in which the appearance can be assessed.

### **COLOUR AND TEXTURE**

Natural colour variations and surface characteristics are dependent on brick type and manufacturer specified in addition to the joint mortar utilized. By nature of the raw materials used in the manufacture of these products, which are of natural mineral origin, it should be accepted that colour variation will occur and its presence does not equate to the panel being non-compliant or defective. Project specific criteria can be established in this respect prior to manufacture and by reference to the approved project sample panel stated above.

### **EFFLORESCENCE/LIMEBLOOM**

Efflorescence/limebloom is a natural occurring phenomenon caused by the migration of salts to the surface of brickwork and concrete during the curing process. It is more apparent on darker shades.

Measures taken to minimize this risk beyond the use of an acrylic polymer in the GRC formulation include:

- Curing the GRC for seven days at controlled temperatures above 15C.
- Allowing air to circulate between packed elements.
- Ensuring panels are not stored horizontally allowing water to settle on the surface.

The amount of salts that can be deposited on the face of the brickwork can vary depending on climate, humidity and porosity of the specified brick. By using a natural hydraulic lime pointing mortar such risk is minimized and in most instances eliminated given the recognised performance attributes of this premium product.

In the unlikely event should it occur, efflorescence/limebloom fades naturally and dissipates with time.

## **REPAIRS**

Repairs to GRC units may result from handling damage or mould release abnormalities. Factory remedial work is carried out prior to dispatch.

## **QUALITY MONITORING**

As part of our Quality Management System, we have our own in-house testing facility that enables us to continually monitor the performance of our GRC products. The testing regimes vary from daily 'calibration' checks to ensure that the constituent components of the manufacturing process are being correctly batched, to weekly tests to monitor the strength and flexural properties of our GRC. Tests follow the recommendations stated within the GRCA "Methods of Testing of Glassfibre Reinforced Concrete (GRC) Material" document, and British Standards referred to in this document.

## **APPROVALS AND ACCREDITATIONS**

Telling Architectural GRC products are manufactured under licence to Byggimpuls Fibrebeton AS, whose systems have over 25 years proven experience in the harsh climates of Scandinavia. As part of our commitment to deliver class leading GRC solutions to the satisfaction of our clients, Telling Architectural manufacture all grades of GRC as recognized by GRCA International for which we hold Full Membership grade status.

Our Quality management system has been registered and assessed in accordance with ISO 9001:2008 – Certificate Number 12363-QMS-001

We take our commitment to the environment very seriously and are accredited to ISO14001:2004 – Certificate Number 12363-EMS-001

Our Environmental Policy and Safety Data Sheets can be viewed/requested on our website [www.telling.co.uk](http://www.telling.co.uk).

## REFERENCES

This document has been compiled with reference to the following:

Specification for the Manufacture, Curing and Testing of Glassfibre Reinforced Concrete (GRC) Products. Published by: The International Glassfibre Reinforced Concrete Association (GRCA)

Methods of Testing of Glassfibre Reinforced Concrete (GRC). Published by: The International Glassfibre Reinforced Concrete Association (GRCA)

BS EN 1169 Precast concrete products. General rules for factory production control of glass-fibre reinforced cement.

BS EN 1170 Parts 1-7 Precast concrete products. Test methods for glass-fibre reinforced cement.

BS476-4 Fire tests on building materials and structures. Non-combustibility test for materials.

BS 476-6 Fire tests on building materials and structures. Method of test for fire propagation for products.

BS 476-7 Fire tests on building materials and structures. Method for classification of the surface spread of flame of products.

BS EN 13501-1:2007+A1:2009 Fire Classification of construction products and building elements. Classification using test data from reaction to fire tests.

BS EN 15422:2008 Precast concrete products-specification of glassfibres for mortars and concrete.

BS EN 771-1:2011 + A1:2015 Specification for masonry units. Clay masonry units, or as stated in brick manufacturers Declaration of Performance.

BS EN 998-1:2016 Specification for mortar for masonry.

PAS 70:2003 BSI Publicly Available Specification HD Clay bricks – Guide to appearance and site measured dimensions and tolerance.

*The above information is based upon years of research, experience and testing, and is provided in good faith and to the best of our knowledge. As part of our commitment to continuously improve and develop our systems, and meet the changes in technical progress, revised standards and legislation, we reserve the right to amend our specification at any time. The latest version of this document can be found on our website [www.telling.co.uk](http://www.telling.co.uk).*

Contact

**Telling Architectural Limited**

Unit 4E

Station Road

Four Ashes

Wolverhampton

WV10 7DB

Tel: +44 (0) 1902 797700

Fax: +44 (0) 1902 797720

Email: [Info@telling.co.uk](mailto:Info@telling.co.uk)

[www.telling.co.uk](http://www.telling.co.uk)



Excellence in GRC