

# PRODUCT SPECIFICATION SHEET

## BELZONA 4111

FN10007



### GENERAL INFORMATION

**Product Description:**

Repair system, comprising a two component epoxy resin system (**Belzona 4151**) combined with selected quartz particles, for repairing and resurfacing concrete and stonework damaged by impact, vibration, chemicals and environmental attack. Also for grouting and bonding. Offers outstanding abrasion and chemical resistance.

**Application Areas:**

When mixed and applied as detailed in the Belzona Instructions for Use (IFU), the system is ideally suited for:

Repairing and rebuilding any structure made from concrete, brick, marble, stone, etc.

Lining concrete surfaces subject to chemical attack.

Surfacing and resurfacing areas subject to extreme wear, impact and abrasion.

### APPLICATION INFORMATION

**Working Life**

Will vary according to temperature. At 77°F (25°C), use all mixed material within 30 minutes.

**Coverage Rates**

Each 15 kg unit applied at film thickness of ¼ inch (6 mm) will cover approximately 12 ft<sup>2</sup> (1.1 m<sup>2</sup>).

**Cure Time**

Will be reduced for thicker sections and extended for thinner applications. Allow to solidify for the times shown in the Belzona IFU before subjecting it to the conditions indicated.

**Volume Capacity**

414 in<sup>3</sup> (6783 cm<sup>3</sup>) per 15 kg unit.

**Base Component**

Appearance	Clear Liquid
Colour	Light amber
Viscosity	5 - 7 poise at 77°F (25°C)
Density	1.16 g/cm <sup>3</sup>

**Solidifier Component**

Appearance	Clear Liquid
Color	Amber
Viscosity	0.5 - 1.5 poise at 77°F (25°C)
Density	1.00 g/cm <sup>3</sup>

**Aggregate Component**

Appearance	Pre-wetted, fine granular powder
Color	Light gray or Beige
Density	2.6 - 2.9 g/cm <sup>3</sup>

**Mixing Ratio**

For mixing small quantities the mixing ratio by weight of the component is:-

(Base : Solidifier : Aggregate)	2 : 1 : 30
Mixing ratio by volume (Base : Solidifier)	2 : 1

Aggregate may be added to desired consistency.

*The above application information serves as introductory guide only. For full application details including the recommended application procedure/technique, refer to the Belzona IFU which is enclosed with each packaged product.*

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### ABRASION

#### Taber

When tested in accordance with ASTM D4060 with a 1kg load, typical loss per 1,000 cycles is:

Wet (H10 wheels)	820 mm <sup>3</sup>
Dry (CS17 wheels)	14 mm <sup>3</sup>

### ADHESION

#### Tensile Shear

The tensile shear adhesion to steel of the polymeric binder, when tested in accordance with ASTM D1002 is typically 2,700 psi (18.62 MPa).

#### Positest dolly pull-off (ASTM D4541)

Dry concrete	525 psi (3.62 MPa)*
Wet concrete	450 psi (3.10 MPa)*

\* Cohesive failure of substrate

### CHEMICAL RESISTANCE

Once fully cured, the material will demonstrate excellent resistance to most commonly found inorganic acids and alkalis at concentrations up to 20%.

The material is also resistant to hydro-carbons, mineral oils, lubricating oils and many other commonly found chemicals.

\* For a more detailed description of chemical resistance properties, refer to relevant Chemical Resistance chart.

### COMPRESSIVE PROPERTIES

#### Compressive Strength

When tested in accordance with ASTM D695 the compressive strength is typically 13,000 psi (89.63 MPa).

#### Compressive Modulus

When tested in accordance with ASTM D695 the compressive modulus is typically  $1.16 \times 10^5$  psi (800 MPa).

### HARDNESS

#### Shore D

The Shore D hardness of the material when tested in accordance with ASTM D2240 is typically: 80.5.

### ELECTRICAL PROPERTIES

#### Dielectric Strength

Tested to ASTM D149 is typically: 142.5 volts/mil (5700 volts/mm).

#### Loss Tangent

Tested to ASTM D150 is typically: 0.038 at 1MHz

#### Permittivity

The permittivity of the material when tested in accordance with ASTM D150 is typically: 4.25

#### Surface Resistivity

Tested to ASTM D257 is typically:  $3.98 \times 10^{14}$  ohms

#### Volume Resistivity

Tested to ASTM D257 is typically:  $1.0 \times 10^{13}$  ohm cms

### FLEXURAL PROPERTIES

#### Flexural Strength

The flexural strength of the material when tested to ASTM D790 is typically 5,500 psi (37.9 MPa).

The flexural strength of the polymeric binder when tested to ASTM D790 will be typically 13,000 psi (89.6 MPa).

#### Flexural Modulus

When tested in accordance with ASTM D790 the flexural modulus is typically  $1.01 \times 10^6$  psi (6964 MPa).

### HEAT RESISTANCE

#### Heat Distortion Temperature (HDT)

The heat distortion temperature when tested to ASTM D648 is typically 97°F (36°C).

#### Heat Resistance

For many typical applications, the product is thermally stable to 300°F (150°C) dry and 140°F (60°C) wet, and down to -40°F (-40°C).

### SHRINKAGE

#### Shrinkage

The material, when tested in accordance with ASTM C157, will show no measurable shrinkage during cure.

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### THERMAL PROPERTIES

#### Thermal Conductivity

The thermal conductivity of the material, when tested in accordance with BS 874 or similar test method is typically 1.9 W/M<sup>2</sup>K.

#### Thermal Expansion

Tested to ASTM E228 the coefficient of thermal expansion is typically 28.2 ppm/°C.

### SHELF LIFE

**Belzona 4111** shall have a shelf life of 5 years from date of manufacture when stored in their original unopened containers between 32°F (0°C) and 86°F (30°C).

### APPROVALS/ACCEPTANCES

The material has received recognition from organizations worldwide including:

U.S.D.A.  
GENERAL MOTORS  
G.E. NUCLEAR ENERGY  
FORD  
FLORIDA DEPARTMENT OF TRANSPORT  
RHODE ISLAND DEPARTMENT OF TRANSPORT

### WARRANTY

Belzona guarantees this product will meet the performance claims stated herein when material is stored and used as instructed in the Belzona Information For Use leaflet. Belzona further guarantees that all its products are carefully manufactured to ensure the highest quality possible and tested strictly in accordance with universally recognised standards (ASTM, ANSI, BS, DIN, ISO etc.). Since Belzona has no control over the use of the product described herein, no warranty for any application can be given.

### AVAILABILITY AND COST

**Belzona 4111** is available from a network of Belzona Distributors throughout the world for prompt delivery to the application site. For information, consult the Belzona Distributor in your area.

### HEALTH AND SAFETY

Prior to using this material, please consult the relevant Material Safety Data Sheets.

### MANUFACTURER

Belzona Polymerics Ltd.  
Claro Road, Harrogate,  
HG1 4DS, UK

Belzona Inc.  
14300 N.W. 60<sup>th</sup> Ave,  
Miami Lakes, FL, USA, 33014

### TECHNICAL SERVICE

Complete technical assistance is available and includes fully trained Technical Consultants, technical service personnel and fully staffed research, development and quality control laboratories.

The technical data contained herein is based on the results of long term tests carried out in our laboratories and to the best of our knowledge is true and accurate on the date of publication. It is however subject to change without prior notice and the user should contact Belzona to verify the technical data is correct before specifying or ordering. No guarantee of accuracy is given or implied. We assume no responsibility for rates of coverage, performance or injury resulting from use. Liability, if any, is limited to the replacement of products. No other warranty or guarantee of any kind is made by Belzona, express or implied, whether statutory, by operation of law or otherwise, including merchantability or fitness for a particular purpose.

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