

# PRODUCT SPECIFICATION SHEET

## BELZONA 4111

FN10209



### 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 the recommended film thickness of ¼ inch (6 mm) will cover approximately 12 sq.ft (1.1 sq.m.).

**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**

400 cu.ins. (6,555 cm<sup>3</sup>) per 15 kg unit.

**Base Component**

Appearance	Clear Liquid
Colour	Light amber
Viscosity	3.6-4.8 poise at 77°F (25°C)
Density	1.16 g/cm <sup>3</sup>

**Solidifier Component**

Appearance	Clear Liquid
Colour	Amber
Viscosity	0.5 - 1.5 poise at 77°F (25°C)
Density	1.02 g/cm <sup>3</sup>

**Aggregate Component**

Appearance	Pre-wetted, fine granular powder
Colour	Light grey or Beige
Density	2.59 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)	535 mm <sup>3</sup>
Dry (CS17 wheels)	9 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 2,620 psi (18.0 MPa).

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

Dry concrete	1,280 psi (8.83 MPa)**
Wet concrete	1,190 psi (8.21 MPa)**

\* With Belzona 4911 as conditioner

\*\* Cohesive failure of substrate

### CHEMICAL RESISTANCE

Belzona 4111 is resistant to a broad range of chemicals including: alkalis, hydrocarbons, detergent solutions, mineral and lubricating oils, salts 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 15,930 psi (109.9 MPa).

#### Compressive Modulus

When tested in accordance with ASTM D695 the compressive modulus is typically  $1.70 \times 10^5$  psi (1,176 MPa).

### 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 5,900 psi (40.69 MPa).

The flexural strength of the polymeric binder when tested to ASTM D790 will be typically 10,150 psi (70.0 MPa).

#### Flexural Modulus

When tested in accordance with ASTM D790 the flexural modulus is typically  $1.45 \times 10^6$  psi (10,021 MPa).

### HEAT RESISTANCE

#### Heat Distortion Temperature (HDT)

The heat distortion temperature when tested to ASTM D648 is typically 117°F (47°C).

#### Dry Heat Resistance

The indicated degradation temperature in air based on Differential Scanning Calorimetry (DSC) operated in accordance with ISO11357 is typically 392°F (200°C).

For many applications the product is suitable 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 28.2ppm/°C.

### SHELF LIFE

All components 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).

### WARRANTY

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 ensures that all its products are carefully manufactured to ensure the highest quality possible and are tested strictly in accordance with universally recognized 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.

### MANUFACTURER / SUPPLIER

Belzona Limited,  
Claro Road, Harrogate,  
HG1 4DS, UK

### HEALTH AND SAFETY

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

### 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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