

PRODUCT SPECIFICATION SHEET

BELZONA 4311

FN10084



GENERAL INFORMATION

Product Description:

A high performance, two-component barrier coating with outstanding resistance to a broad range of chemicals, especially acids and alkalis.

Application Areas:

When mixed and applied as detailed in the Belzona Instructions for Use (IFU), the system, which isolates concrete and metal substrates from deteriorating chemical environments, is ideally suited for application to:

- Acid retaining walls
- Chemical drains and channels
- Chemical transfer and holding areas
- Pump bases
- Pump casings
- Tank pads
- Walkways (with non-slip aggregate incorporated)
- Tanks

APPLICATION INFORMATION

Cure Time

Allow to solidify for the times shown in the Belzona IFU before subjecting it to the conditions indicated.

Note: Below 59°F (15°C), solidification times will be significantly extended and the resultant chemical resistance capability of the **Belzona 4311** will be reduced.

For optimum results, **Belzona 4311** should be forced cured at 180°F (80°C) for 4 hours. This will ensure the very best chemical resistance.

Coverage Rate

Theoretical coverage rate of a 1.5kg unit is 50.0 sq.ft. (4.6m²) at the recommended thickness of 10 mils (250 micron) per coat.

Application to rough or irregular surfaces may reduce this coverage by 20-25%.

Volume Capacity

71 cu.ins. (1160 cm³) per 1.5 kg unit.

Base Component

Appearance	Thixotropic liquid
Color	Dark Red or Gray
Gel Strength	70 -120 g/cm ³
Density	1.34 - 1.38 g/cm ³

Solidifier Component

Appearance	Clear Liquid
Color	Amber
Viscosity	0.4 - 1 poise at 77°F (25°C)
Density	1.02 - 1.04 g/cm ³

Mixed Properties

Mixing Ratio by Weight (Base : Solidifier)	5 : 1
Mixing ratio by Volume (Base : Solidifier)	3.8 : 1
Density	1.27 - 1.31 g/cm ³
Sag Resistance	> 30 mil
Time to Peak Exotherm at 68°F (20°C)	30 - 45 minutes
Peak Exotherm Temperature	320 - 374°F (160 - 190°C)
Useable Life at 68°F (20°C)	20 - 25 minutes
Resistance to 98% Sulfuric Acid, percent weight loss, of cured coupon after 7 days immersion at 77°F (25°C) is < 2.0.	

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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ADHESION

Tensile Shear

When tested in accordance with ASTM D1002, the adhesion to grit blasted steel will typically be:

2900 psi (20.0 MPa)

Pull Off Adhesion

When tested in accordance with ASTM D 4541/ ISO 4624, the pull off strength from grit blasted steel will typically be:

5300 psi (36.5 MPa)

CATHODIC PROPERTIES

Cathodic Disbondment

When tested in accordance with ASTM G8 a rating Class B is obtained.

CHEMICAL ANALYSIS

The mixed **Belzona 4311** has been independently analyzed for halogens, heavy metals, and other corrosion-causing impurities, with the following typical results:

Analyte	Total Concentration (ppm)
Fluoride	20
Chloride	1005
Bromide	ND (<12)
Sulfur	264
Nitrite	ND (<9)
Nitrate	ND (<9)
Zinc	3.2
Bismuth	3.1
Tin	8.1
Antimony, Arsenic, Cadmium, Lead, Silver, Mercury, Gallium and Indium	ND (<3.0)

ND : Not Detected

CHEMICAL RESISTANCE

This material offers excellent resistance to a broad range of chemicals particularly acids and alkali's

* For a more detailed description of chemical resistance properties, determined in accordance with ISO 2812-1, please refer to relevant Chemical Resistance chart.

COMPRESSIVE PROPERTIES

Compressive Strength

The compressive yield strength of the material when tested to ASTM D695 is typically:

12,000 psi (82.7 MPa).

ELECTRICAL PROPERTIES

When tested in accordance with ASTM D149, method A, with voltage rise of 2kV/s, typical value will be:

Dielectric strength

46.8 kV/mm

FLAMMABILITY

When tested in accordance with ASTM E648, **Belzona 4311** has a critical radiant flux greater than 1.07W/cm². The coating therefore is Class 1 in accordance with model building codes.

FLEXURAL PROPERTIES

Flexural Strength

The flexural strength of the material when tested to ASTM D790 is typically:

10,000 psi (68.9 MPa).

HEAT RESISTANCE

Heat Distortion Temperature (HDT)

The heat distortion temperature (HDT) of the material when tested in accordance with ASTM D648, under 264 psi fiber stress will typically be:

Cure Schedule

7 days @ 68°F (20°C) cure
7 days @ 212°F (100°C) post cure

HDT Values

118°F (48°C)
181°F (83°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).

Wet Heat Resistance

Suitable for service at temperatures up to 140°F (60°C) but refer to chemical resistance data for chemical contact limitations.

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IMPACT RESISTANCE

Izod Impact

The impact strength when tested in accordance with ASTM D256 is typically:

0.41 ft.lb./in. (22J/m). (Reverse notched)

THERMAL PROPERTIES

Thermal Expansion

Tested to ASTM E228 the coefficient of thermal expansion is typically 61.9 ppm/°C.

SHELF LIFE

Separate base and solidifier 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).

APPROVALS/ACCEPTANCES

The material has received recognition from organizations worldwide including:

U.S.D.A.
DEGUSSA
RHODE ISLAND DEPARTMENT OF TRANSPORT
PAPER BOARD INDUSTRIES CORPORATION

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 4311 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

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

Belzona Inc.
2000 N.W. 88th Court,
Miami, Florida, USA, 33172

HEALTH AND SAFETY

Prior to using this material, please consult the relevant Material 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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