BELZONA 4311 Product Specification Sheet

1. PRODUCT NAME

Belzona® 4311 (Magma CR1)
The barrier coating for protecting surfaces against the effects of chemical attack.

2. MANUFACTURER

Belzona Inc.,
2000 NW 88th Court,
Miami, Florida 33172.

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

3. PRODUCT DESCRIPTION

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

4. TECHNICAL DATA

Base Component

Appearance	Thixotropic liquid
Color	Dark Red or Gray
Gel Strength	70 -120 g/cm³
Density	1.34 - 1.38 g/cm³

Solidifier Component

Appearance	Clear Liquid
Color	Amber
Viscosity	0.4 - 1 poise at 77°F (25°C)
Density	1.02 - 1.04 g/cm³

Mixed Tests

Mixing Ratio by Weight (Base : Solidifier)	5 : 1
Mixing ratio by Volume (Base : Solidifier)	3.8 : 1
Density	1.27 - 1.31 g/cm³
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.

• Shelf Life:
All components when stored between 32°F (0°C) and 86°F (30°C) will have a shelf life of 5 years.

• Coverage Rates:
Each 1.5 kg unit applied at the recommended film thickness of 10 mils (250 microns) will cover approximately 44 - 48 ft² (4 - 4.4m²). Application to rough or irregular surfaces may reduce this coverage by 20 - 25%.

• Volume Capacity:
The volume capacity of mixed product is 71 cu.ins. (1160 cm³) per 1.5 kg unit.

• Cure Time:
Allow to solidify for the times shown in the chart below 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.

5. PHYSICAL/ MECHANICAL PROPERTIES

Determined after 7 days cure at 77°F (25°C).

• Adhesion:
Tensile Shear
The tensile shear adhesion shall be tested to ASTM D1002. Surface preparation shall be grit blasting with a profile of 0.003 - 0.004 inch. Typical values obtained will be:
Steel 2900 psi (204 kg/cm²)

Pull Off Adhesion
When tested in accordance with ASTM D 4541/ ISO 4624, the pull off strength from grit blasted steel will be typically:
5300 psi (373 kg/cm²) ambient cure

• Cathodic Disbondment:
When tested in accordance with ASTM G8 a rating Class B is obtained.

• Chemical Resistance:
This material offers resistance to a broad range of chemicals.

For specific chemical resistance data please refer to product data Q502.

• Compressive Strength:
The compressive yield strength of the material when tested to ASTM D695 is typically 12,000 psi (844 kg/cm²).

• 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 Strength:
The flexural strength of the material when tested to ASTM D790 is typically 10,000 psi (703 kg/cm²).

CURE TIMES

Temperature	**59°F (15°C)**	**68°F (20°C)**	**77°F (25°C)**	**86°F (30°C)**
Light pedestrian traffic	16 hrs	12 hrs	8 hrs	6 hrs
Vehicular traffic	48 hrs	36 hrs	24 hrs	20 hrs
Full chemical resistance	14 days	7 days	6 days	5 days

• Heat Distortion Temperature:
The heat distortion temperature (HDT) of the material shall be tested in accordance with ASTM D648, under 264 psi fiber stress. Typical results obtained using different cure schedules will be as follows:

Cure Schedule	HDT Values
7 days @ 20°C cure	118°F (48°C)
7 days @ 100°C post cure	181°F (83°C)

• Heat Resistance:
For many typical applications, the product is thermally stable to 392°F (200°C) dry and 140°F (60°C) wet, and down to -40°F (-40°C).

• Impact Strength:
The material, when tested in accordance with ASTM D256 is typically 0.41 ft.lbs./in. (22J/m). (Reverse notched Izod.)

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

6. SURFACE PREPARATION AND APPLICATION PROCEDURES
For proper techniques, refer to Belzona® Instructions For Use which is enclosed with each packaged product.

7. 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.

8. WARRANTY
Belzona® guarantees this product will meet the performance claims stated herein when material is stored and used as instructed in the Belzona® Instructions 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, etc.). Since Belzona® has no control over the use of the product described herein, no warranty for any application can be given.

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

10. HEALTH AND SAFETY
Prior to using this material, please consult the relevant Material Safety Data Sheets.

11. APPROVALS/ ACCEPTANCES
U.S.D.A.
DEGUSSA
RHODE ISLAND DEPARTMENT OF TRANSPORT
PAPER BOARD INDUSTRIES CORPORATION

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