BELZONA® World leaders in the conservation of man-made resources and the environment

# PRODUCT SPECIFICATION SHEET
# BELZONA® 5811

## 1. PRODUCT NAME

**Belzona® 5811**
**(Immersion Grade)**
A high performance barrier coating for protection of metallic and non-metallic surfaces against attack from aqueous solutions.

Also used as a high strength structural adhesive for bonding or for creation of irregular load bearing shims with good electrical insulation characteristics.

For use in Original Equipment Manufacture or repair situations.

## 2. MANUFACTURER

**Belzona Polymerics Ltd.,**
Claro Road, Harrogate,
HG1 4AY, England.

**Belzona Inc.,**
2000 N.W. 88 Court,
Miami, Florida 33172, U.S.A.

## 3. PRODUCT DESCRIPTION

A two component system applied by brush or spray for protection of metallic and non-metallic surfaces operating under immersion conditions in contact with aqueous solutions.

Applications
Cooling tower pans
Submersible pumps
Effluent tanks and channels
Marine buoys
Storage tanks
Water Boxes
Manholes
Internal and external pipework
Steel and concrete piling
Water inlet screens
Chemical containment areas
Sludge digesters
Buried pipework and structures

## 4. TECHNICAL DATA

Base Component

| | |
|---|---|
| Appearance | Viscous liquid |
| Color | Black, Beige or Grey |
| Density | 1.61 - 1.66 g/cm³ |

Solidifier Component

| | |
|---|---|
| Appearance | Clear mobile liquid |
| Color | Dark brown |
| Density | 1.18 - 1.22 g/cm³ |

Mixed Properties at 68°F (20°C)

| | |
|---|---|
| Mixing Ratio by Weight (Base : Solidifier) | 5 : 1 |
| Mixing Ratio by Volume (Base : Solidifier) | 3 : 1 |
| Mixed Density | 1.39 - 1.42 g/cm³ |

### • *Shelf Life:*

Separate base and solidifier components shall have a shelf life of at least 5 years when stored between 32°F (0°C) and 86°F (30°C).

### • *Working Life:*

Will vary according to temperature. At 68°F (20°C) the usable life of mixed material is 2 hours.

### • *Coverage Rate:*

Applied at a thickness of 10mil (250 microns), a theoretical coverage rate of 43 sq.ft./liter (4 sq.m./liter) should be achieved.

### • *Cure Time:*

The **Belzona® 5811** system should be allowed to cure for 10 days at 59°F (15°C) or 5 days at 68°F (20°C) before being immersed.

## 5. PHYSICAL/MECHANICAL PROPERTIES

Determined after 7 days cure at 77°F (25°C) ambient cure or 24 hours at 77°F (25°C) followed by 4 hours at 212°F (100°C) post cure.

### • *Adhesion:*

**Tensile Shear**
When tested in accordance with ASTM D1002, using metal substrates, grit blasted to a 3-4 mil profile, typical values will be:

| | Ambient Cure | Post Cure |
|---|---|---|
| Aluminum | 1,600 psi (112 kgs/cm²) | 2,260 psi (159 kgs/cm²) |
| Brass | 2,560 psi (180 kgs/cm²) | 2,565 psi (180 kgs/cm²) |
| Mild steel | 2,700 psi (190 kgs/cm²) | 3,300 psi (232 kgs/cm²) |
| Copper | 1,890 psi (133 kgs/cm²) | 2,080 psi (146 kgs/cm²) |
| Stainless steel | 2,510 psi (176 kgs/cm²) | 2,520 psi (177 kgs/cm²) |

### • *Atlas Cell Testing:*

When tested in accordance with NACE standard TM01-74 in contact with water at 122°F (50°C) no blistering is observed in the immersed portion or vapour phase after 670 hours immersion.

### • *Chemical Resistance:*

The material will demonstrate excellent resistance to the following chemicals;

10% sulfuric acid
20% hydrochloric acid
10% phosphoric acid
sodium hydroxide (all concentrations)
ethyl acetate
ethylene glycol
25% ammonia solution
diethanolamine
sea water
water
crude oil
Gasoline (petrol)
Toluene

* *For a more detailed description of chemical resistance properties, refer to Product Data G501.*

### • *Compressive Strength:*

When tested in accordance with ASTM D695, typical values obtained will be:

| | |
|---|---|
| 6,760 psi (475 kgs/cm²) | ambient cure |
| 8,700 psi (612 kgs/cm²) | post cure |

| | CURE TIMES | | |
|---|---|---|---|
| TEMPERATURE | 50°F (10°C) | 68°F (20°C) | 86°F (30°C) |
| Light loading | 48 hrs | 24 hrs | 12 hrs |
| Full mechanical/thermal loading or water immersion | 14 days | 5 days | 2 days |
| Chemical contact | 21 days | 7 days | 5 days |

### • *Flexural Strength:*

When tested to ASTM D790 typical values obtained will be:

| | |
|---|---|
| 4020 psi (283 kgs/cm²) | ambient cure |
| 5780 psi (406 kgs/cm²) | post cure |

### • *Hardness:*

The Shore D hardness of the material when tested to ASTM D2240 is typically

| | |
|---|---|
| 80 | ambient cure |
| 84 | post cure |

### • *Heat Resistance:*

For many typical applications the material is suitable for continuous immersion in aqueous solutions up to 122°F (50°C). The material will be stable under dry conditions up to 300°F (150°C).

### • *Impact Strength:*

The Izod impact strength (un-notched) of the material when tested in accordance with ASTM D256 is typically 1 ft.lbs./in (55 J/m) ambient and post cure.

## 6. SURFACE PREPARATION AND APPLICATION PROCEDURES

For proper technique, refer to the Belzona® Instructions For Use leaflet which is enclosed with each packaged product.

## 7. AVAILABILITY AND COST

**Belzona® 5811** 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.
PAPER BOARD INDUSTRIES CORPORATION
RHODE ISLAND DEPARTMENT OF TRANSPORTATION



Belzona Polymerics Ltd.,
Clam Road,
Harrogate, HG1 4AY, England.
Tel: +44 (0) 1423 567641
Fax:+44 (0) 1423 505967
E-Mail: belzona@belzona.co.uk

Belzona Inc.,
2000 N.W. 88 Court,
Miami, Florida 33172, U.S.A.
Tel: +1 (305) 594 4994
Fax:+1 (305) 599 1140
E-Mail: belzona@belzona.com

ISO 9001:2000
Q 09335

BELZONA

www.belzona.com

# Belzona® 5811
**(IMMERSION GRADE)**

BELZONA®

# INSTRUCTIONS FOR USE

## 1. TO ENSURE AN EFFECTIVE MOLECULAR WELD

I) **METALLIC SURFACES - APPLY ONLY TO BLAST CLEANED SURFACES.**

a) Brush away loose contamination and degrease with a rag soaked in **Belzona® 9111** (Cleaner/Degreaser) or any other effective cleaner which does not leave a residue e.g. methyl ethyl ketone (MEK).

b) Select an abrasive to give the necessary standard of cleanliness and a minimum depth of profile of 3 mils (75 microns). Use only an angular abrasive.

c) Blast clean the metal surface to achieve the following standard of cleanliness:
ISO 8501-1 Sa 2½ very thorough blast cleaning:
American Standard near white finish SSPC SP 10.
Swedish Standard Sa 2½ SIS 05 5900.

d) After blasting, metal surfaces should be coated before any oxidation of the surface takes place.

**SALT CONTAMINATED SURFACES**
Metal surfaces that have been immersed for any periods in salt solutions e.g. sea water, should be blasted to the required standard, left 24 hours to allow any ingrained salts to sweat to the surface and then washed prior to a further brush blast to remove these. This process may need to be repeated to ensure complete removal of salts. The soluble salt contamination of the prepared substrate, immediately prior to application, should be less than 30mgs/m².

II) **CONCRETE SURFACES**
Remove all paint, tar and any other coatings.

Any surface to which **Belzona® 5811** is to be applied must be clean, firm and dry. Wash old concrete down with detergent to remove oil, grease and dust. Use clean water to wash away the detergent.

Allow new concrete to cure for a minimum of 28 days or until the moisture content is below 6% using a Protimeter.

Blast clean, or mechanically scarify the surface to remove all loose material and surface laitence.

## 2. COMBINING THE REACTIVE COMPONENTS

Transfer the entire contents of the Solidifier container into the Base container. Mix thoroughly together to achieve a uniform material free of any streakiness.

**NOTES:**

**1. MIXING AT LOW TEMPERATURES**
To ease mixing when the material temperature is below 50°F (10°C), warm the Base and Solidifier modules until the contents attain a temperature of 68-77°F (20-25°C).

**2. APPLICATION AT LOW TEMPERATURES**
**Belzona® 5811** can be applied down to 41°F (5°C) but the product is easier to apply over large areas when the ambient temperature and the surface to be coated are above 50°F (10°C).

**3. WORKING LIFE**
From the commencement of mixing, **Belzona® 5811** must be used within the times shown below.

| Temperature | 50°F(10°C) | 77°F(20°C) | 86°F(30°C) |
|---|---|---|---|
| Use all material within | 3 hours | 2 hours | 1¼ hours |

**4. MIXING SMALL QUANTITIES**
For mixing small quantities of **Belzona® 5811** use:
3 parts Base to 1 parts Solidifier by volume
5 parts Base to 1 parts Solidifier by weight

## 3. APPLYING BELZONA® 5811

**FOR BEST RESULTS**
**Do not apply when:**
(i) The temperature is below 41°F (5°C) or the relative humidity is above 90%.
(ii) Rain, snow, fog or mist is present.
(iii) There is moisture on the metal surface or is likely to be deposited by subsequent condensation.
(iv) The working environment is likely to be contaminated by oil/grease from adjacent equipment or smoke from kerosene heaters or tobacco smoking.

a) **FIRST COAT**
Apply the **Belzona® 5811** directly on to the prepared surface with a short bristled brush or rubber squeegee.

In order to achieve the correct film thickness of 10 mils (250 microns) per coat, apply the material at a theoretical coverage rate of 43 sq. ft. (4.0 m²) per litre. (See below).

b) **SECOND COAT**
As soon as possible after application of the first coat, apply a further coat of **Belzona® 5811** as in (a) above. This time will be 6 - 8 hours at 68°F (20°C). The first coat must not be left longer than 72 hours before overcoating, irrespective of temperature. Should this occur, then the surface should be brush blasted or abraded before commencing application.

**SPRAY APPLICATION**
On suitable areas, **Belzona® 5811** may be applied by heated airless spray. Typical set up would be 63:1 airless spray unit with either in-line heater or trace heated lines capable of raising product temperature to at least 122°F (50°C). Solvent must **NOT** be added. Please contact Belzona direct for more specific information.

**THEORETICAL COVERAGE RATES**
The theoretical coverage rate for the two coat system will be 21.5 sq. ft. (2.0 m²) per litre.

**PRACTICAL COVERAGE RATES**
In practice many factors influence the exact coverage rate achieved. On rough surfaces such as pitted steel and concrete the coverage rate achieved may be reduced by up to 20%.

**NOTES:**
**CLEANING**
Mixing tools should be cleaned immediately after use with **Belzona® 9111** or any other effective solvent e.g. Methyl ethly ketone (MEK). Brushes and any other application tools should be cleaned using a suitable solvent such as **Belzona® 9121**, MEK, acetone or cellulose thinners.

**DIFFERENTIATION BETWEEN LAYERS**
**Belzona® 5811** is available in different colours, to facilitate application and to prevent misses. In service the colour of the applied product may change.

## 4. COMPLETION OF THE MOLECULAR REACTION

**Belzona® 5811** will solidify under cold, damp conditions down to a temperature of 41°F (5°C). However, solidification time is dependent on ambient temperature, the lower the temperature the longer the solidification time.

Allow **Belzona® 5811** to solidify as below subjecting it to the conditions indicated.

| Temp-erature | Light loading | Full mechanical/ thermal loading or water immersion | Chemical contact |
|---|---|---|---|
| 50°F/10°C | 48 hours | 14 days | 21 days |
| 68°F/20°C | 24 hours | 5 days | 7 days |
| 86°F/30°C | 12 hours | 2 days | 5 days |

**HEALTH & SAFETY INFORMATION**
Please read and make sure you understand the relevant Material Safety Data Sheets.



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ISO 9001:2000
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Printed in England Publication No. 21-2-07