Belzona 7311

FN10213

BELZONA®
Repair • Protect • Improve

INSTRUCTIONS FOR USE

1. TO ENSURE AN EFFECTIVE MOLECULAR WELD

For optimum performance, the highest level of surface preparation should be carried out as follows:

i) METALLIC SURFACES – OPTIMAL SURFACE PREPARATION.

a) Brush away loose contamination and degrease with a suitable solvent/cleaner which does not leave a residue e.g., methyl ethyl ketone (MEK), acetone, **Belzona® 9111**.

b) Select an abrasive to give the necessary standard of cleanliness and a minimum depth of profile of 75 microns (3 mils). 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.
Note: Blast equipment and blast media should be clean, dry and free of any grease.

d) To ensure the surface is clean after blasting, remove any residual dust or debris using dry compressed air or suitable vacuum equipment.
Alternatively, should it be practical to do so e.g., for smaller components or external articles, an additional solvent wash/clean can be carried out to remove residuals from the blast process.
Note: Should any residual grease be present, the metal surface must be degreased with an appropriate solvent.

e) After blasting and cleaning, **Belzona® 7311** should be applied before any oxidation on the metal surfaces occurs.

ii) METALLIC SURFACES – MINIMUM SURFACE PREPARATION.

a) Brush away loose contamination and degrease with a suitable solvent/cleaner which does not leave a residue e.g., methyl ethyl ketone (MEK), acetone, **Belzona® 9111**.

b) Power tool clean to achieve an SSPC-SP 11 bare metal power tool cleaned surface with a minimum profile of 25 micron (1 mil).

c) To ensure the surface is clean after roughening, remove any residual dust or debris using dry compressed air or suitable vacuum equipment.
Alternatively, should it be practical to do so e.g., for smaller components or external articles, an additional solvent wash/clean can be carried out to remove residuals from the roughening process.
Note: Should any residual grease be present, the metal surface must be degreased with an appropriate solvent.

iii) NON-METALLIC SURFACES – APPLY ONLY TO CLEAN, FIRM, DRY AND WELL ROUGHENED SURFACES.

a) Brush away loose contamination and if required, degrease with a solvent/cleaner which is suitable for the substrate.

b) Roughen surfaces by blast cleaning, deeply scoring or grinding.
Note: Blast equipment and blast media should be clean, dry and free of any grease.

c) To ensure the surface is clean after roughening, remove any residual dust or debris using dry compressed air or suitable vacuum equipment.
Alternatively, should it be practical to do so e.g., for smaller components or external articles, an additional solvent clean can be carried out to remove residuals from the roughening process using a suitable solvent for the substrate.
Note: Should any residual grease be present, the surface must be degreased with an appropriate solvent for the substrate.

WHERE BELZONA® 7311 SHOULD NOT ADHERE
Brush on a thin layer of **Belzona® 9411** (Release Agent) and allow to dry for 15-20 minutes before proceeding to Step 2.

2. COMBINING THE REACTIVE COMPONENTS

Transfer the entire contents of the Base and Solidifier modules on to the **Belzona® Working Surface**. Mix thoroughly together to achieve a uniform material free of any streakiness.

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

2. APPLICATION AT LOW TEMPERATURES
Belzona® 7311 can be applied down to 5°C (41°F) but to ease application and to ensure effective wetting out of the substrate, where possible, maintain the temperature of the mixed material at 20 - 25°C (68 - 77°F).

3. WORKING LIFE

From the commencement of mixing, **Belzona® 7311** must be used within the times shown below:

Temperature	Use all material within
5°C (41°F)	2 hours
10°C (50°F)	80 minutes
20°C (68°F)	40 minutes
30°C (86°F)	30 minutes
40°C (104°F)	20 minutes
50°C (122°F)	15 minutes
60°C (140°F)	10 minutes

4. MIXING SMALL QUANTITIES

Mixing Ratio	By Weight & Volume
Base : Solidifier	3 : 1

3. APPLYING BELZONA® 7311

FOR BEST RESULTS

Do not apply when:

(i) The temperature is below 41°F (5°C), above 60°C (140°F) or the relative humidity is above 85%.
(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) If required, use a suitable tape to define the bonding area, ensuring it can be easily removed without disturbing the joint.

b) On both prepared surfaces of the adhesive joint, using a short bristled brush or suitable application tool, apply a thin layer of **Belzona® 7311** ensuring it fully wets out the prepared surface.

c) Apply additional **Belzona® 7311** onto the centre of one of the previously prepared surfaces and build up into a peak. This ensures there is sufficient product in the bonded joint and trapped air is squeezed out during Step d).

d) Assemble both parts immediately after **Belzona® 7311** has been applied, by pressing the two surfaces firmly together. The maximum recommended bond line thickness is 2mm. **Note: For large bond areas greater than 250mm x 250mm (10" x 10"), mechanical ratchets or magnetic handles will be required to compress the joint.**

e) Ensure the bonded joint is correctly aligned.

f) To confirm maximum contact, **Belzona® 7311** must exude from all corners and edges of the bonded geometry. The bond line must be void free.

g) Excess **Belzona® 7311** beyond the adhesive joint, must be chamfered, prior to cure using the plastic applicator.

h) Ensure any tape used is removed while the product is still wet.

i) If required, apply bonding supports to hold the plate in place and allow **Belzona® 7311** to cure.

NOTE:

a) Belzona® 7311 can be transferred into a suitable cartridge to increase ease of application.

b) The substrate temperature must not exceed 60°C (140°F) during application.

CLEANING

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

COVERAGE RATES

Theoretical coverage rate at 2mm thick adhesive joint/bond line	0.4 m²/0.8 litre unit (4.3 ft²/0.8 litre unit)

4. COMPLETION OF THE MOLECULAR REACTION

Allow **Belzona® 7311** to solidify as below subjecting it to the conditions indicated.

Substrate temperature	Minimum self-supporting time	Time to achieve at least 50% adhesive strength	Time to achieve full adhesive strength
5°C (41°F)	24 hours	48 hours (13.0 MPa/ 1880 psi)	28 days (27.0 MPa/ 3910 psi)
10°C (50°F)	18 hours	24 hours (13.3 MPa/ 1930 psi)	21 days (32.7 MPa/ 4740 psi)
20°C (68°F)	6 hours	6 hours (15.5 MPa/ 2250 psi)	48 hours (33.4 MPa/ 4840 psi)
30°C (86°F)	4 hours	4 hours (N/A)	24 hours (N/A)
40°C (104°F)	2 hours	2 hours (29.0 MPa/ 4200 psi)	4 hours (33.9 MPa/ 4910 psi)
50°C (122°F)	1 hour	1 hour (N/A)	2 hours (N/A)
60°C (140°F)	20 minutes	30 minutes (28.8 MPa/ 4180 psi)	1 hour (31.2 MPa/ 4520 psi)

At temperatures below 20°C (68°F), it is recommended to warm the substrate and environment to accelerate cure and deliver maximum adhesion in a shorter time. See Section 5 for further details.

5. EFFECTING THE SECONDARY MOLECULAR REACTION

The mechanical properties and heat resistance of **Belzona® 7311** may be improved by force curing.

Immediately after applying **Belzona® 7311**, force cure the material using forced air heaters, heat lamps, etc. for a minimum of 1 hour at 60°C (140°F).

Alternatively, **Belzona® 7311** can be post-cured via heating to 60°C (140°F) following any period of ambient or low temperature cure.

6. OVERCOATING AND ENCAPSULATING BELZONA® 7311 BONDED GEOMETRIES

In the event the **Belzona® 7311** bonded joint requires a topcoat for corrosion protection or chemical immersion, a **Belzona®** coating can be applied. Where necessary, contact your **Belzona®** representative for best recommendation.

Before the appropriate **Belzona®** coating is applied, irrespective of temperature, after 50% adhesive strength of **Belzona® 7311** is achieved:

a) Any exposed surfaces of **Belzona® 7311** must be roughened by abrading or flash blasting to produce a frosted appearance, free of any gloss, with a target profile of 25 microns.

b) In accordance with the IFU of the **Belzona®** coating to be applied, the surrounding substrate must be suitably prepared.

c) Apply the **Belzona®** coating onto the prepared **Belzona® 7311** and the prepared substrate in accordance with the IFU of the **Belzona®** coating to be applied.

HEALTH & SAFETY INFORMATION

Please read and make sure you understand the relevant Safety Data Sheets.

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