Belzona 1591

(CERAMIC XHT)

BELZONA®
Repair • Protect • Improve

INSTRUCTIONS FOR USE

1. TO ENSURE AN EFFECTIVE MOLECULAR WELD

METALLIC SURFACES - APPLY ONLY AFTER BLAST CLEANING

a) Brush away any loose contamination and remove dirt, oil, grease etc., with **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 with low chloride content.

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 SP10
Swedish Standard SA2½ SIS 05 5900

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

NOTE: SALT CONTAMINATED SURFACES
The soluble salt contamination of the prepared substrate, immediately prior to application, shall be less than 20mg/m² (2µg/cm²).

Metal surfaces that have been immersed for any periods in salt solutions e.g. sea water, should be blasted to the required standard, left for 24 hours to allow the ingrained salts to sweat to the surface, then washed prior to a further brush blast to remove these. This process may need to be repeated several times to ensure complete removal of the salts. Salt removal aids are commercially available that will assist and speed salt removal. Contact Belzona for best recommendation.

2. PIT FILLING

All welds should be prepared to NACE SP0178 Grade C or better. Deep pitting and rough welds should be smoothed out with **Belzona® 1511**. Before application of **Belzona® 1591** these repairs must be allowed to harden in accordance with the relevant Instructions For Use before grit blasting to create a frosted surface free from any gloss with a target profile of 40 microns.

3. COMBINING THE REACTIVE COMPONENTS

a) Ensure material is at a temperature of 68-85°F (20-30°C) to aid mixing and application.

b) Transfer approximately a quarter of the contents of the **Belzona® 1591** Solidifier can to the **Belzona® 1591** Base unit.

c) Mix until a uniform consistency is achieved.

d) Add the remainder of the Solidifier and mix thoroughly to a uniform streak-free material.

NOTES:

1. **APPLICATION TEMPERATURE**
Belzona® 1591 should not be applied at temperatures below 65°F (18°C).

2. **WORKING LIFE**
From the commencement of mixing, **Belzona® 1591** must be used within the times shown:

Temperature	65°F (18°C)	75°F (24°C)	85°F (30°C)	105°F (40°C)
Use all material within	55 mins	40 mins	25 mins	12 mins

3. **VOLUME CAPACITY OF MIXED BELZONA® 1591**
31.1 cu.in. (510 cm³) per kg.

4. APPLYING BELZONA® 1591

FOR BEST RESULTS
Do not apply when:-

i) The temperature is below 65°F (18°C) or the relative humidity is above 85%.
ii) The substrate temperature is less than 5°F (3°C) above dewpoint.
iii) Rain, snow, fog or mist is present.
iv) There is moisture on the metal surface or is likely to be deposited by subsequent condensation.
v) The working environment is likely to be contaminated by oil/grease from adjacent equipment or smoke from kerosene heaters or tobacco smoking.

4.1 COVERAGE RATES

Recommended number of coats	1	2
Target thickness 1st coat	30 mils (750 microns)	24 mils (600 microns)
Target thickness 2nd coat	N/A	12 mils (300 microns)
Minimum total DFT	24 mils (600 microns)	24 mils (600 microns)
Maximum total DFT	40 mils (1 mm)	40 mils (1 mm)
Practical coverage rate 1st coat	6.35 sq.ft (0.59 m²)/kg	7.75 sq.ft (0.72 m²)/kg
Practical coverage rate 2nd coat	N/A	15.7 sq.ft (1.46 m²)/kg
Theoretical coverage rate to achieve minimum recommended thickness	9.1 sq.ft (0.85 m²)/kg	9.1 sq.ft (0.85 m²)/kg

In practice many factors influence the exact coverage rate achieved. On rough surfaces the practical coverage rate will be reduced. Application at low temperatures will also reduce practical coverage rates further.

Note
Total system thickness in stripe coat or repair areas should not exceed 80 mils (2 mm).

Publication No. 17-08-12

4.2 APPLICATION AS A 1 COAT SYSTEM
Where application conditions permit, **Belzona® 1591** may be applied as a single coat.

Apply the **Belzona® 1591** directly on to the prepared surface with a stiff bristled brush or with the plastic applicator provided at the recommended coverage rate.

Ensure maximum thickness of 40 mils (1000 microns) is not exceeded.

TO ACHIEVE A UNIFORM COATING
a) Apply the coating in one operation without interruption.
b) Use a brush or applicator to initially wet out the substrate before building up to the full coating thickness.
c) Use a wet film thickness gauge to regularly check that the correct film thickness is being achieved.
d) Finish application with a brush to obtain uniform coverage.
e) Pay careful attention to coating detail areas such as brackets, edges and corners.
f) Ensure adequate lighting is available to prevent misses.

4.3 APPLICATION AS A 2 COAT SYSTEM
a) Apply the first coat of **Belzona® 1591** at the recommended coverage rate and allow to harden for at least 16 hours.
b) Before carrying out repairs or applying a second coat, wash the surface of the **Belzona® 1591** with a warm detergent solution to remove any amine bloom that has formed. Rinse with clean water and allow to dry.
c) Carefully flash blast using a moderate blast pressure and fine grit to remove surface layer, but without significant loss of coating. A frosted appearance free from gloss should be produced with a target profile of 1.5 mil (40 microns). Remove debris and degrease with **Belzona® 9111** or any other effective cleaner which does not leave a residue e.g. MEK.
d) Apply a second coat of **Belzona® 1591.**
e) Ensure maximum thickness of 40 mils (1000 microns) is not exceeded.

4.4 INSPECTION
a) Immediately after application of each unit, visually inspect for pinholes and misses. Where detected, these should be immediately brushed out.
b) Once the application is complete and the coating has hardened, carry out a thorough visual inspection to confirm freedom from pinholes and misses, and to identify any possible mechanical damage.
c) Spark testing can be carried out to confirm continuity. A DC voltage of 3,000 volts is recommended to confirm that minimum coating thickness of 24 mils (600 microns) has been achieved.

4.5 REPAIRS
Any misses, pinholes or mechanical damage found in the coating should be repaired by brush blasting or abrading the surface to produce a frosted appearance free from gloss should be produced with a target profile of 1.5 mil (40 microns) prior to cleaning the surface and application of further material as detailed above.

4.6 CLEANING
Mixing tools should be **cleaned immediately after use** with **Belzona® 9111** or any other effective solvent e.g. MEK. Brushes, injection guns, spray equipment and other application tools should be cleaned using a suitable solvent such as **Belzona® 9121**, MEK, acetone or cellulose thinners.

5. COMPLETION OF THE MOLECULAR REACTION

The coating should be allowed to cure as follows:

Ambient temperature	Time until inspection	Time until full service	Time until post-cure (if required)	
			Dry	Wet
68°F (20°C)	16 hrs	5 days	16 hrs	48 hrs
86°F (30°C)	4 hrs	20 hrs	4 hrs	8 hrs
104°F (40°C)	2½ hrs	5½ hrs	2½ hrs	4 hrs

Post-cure will generally be unnecessary as the coating will cure sufficiently at ambient temperature with full cure achieved in service. However, post-cure may be desirable to facilitate faster cure and quicker return to service (see below).

POST-CURE
If post-cure is desirable, the coating should be heated to between 122°F (50°C) and 212°F (100°C) for a minimum of 1 hour.

The coating should be allowed to cure as detailed in the above table prior to a dry (e.g. hot air) or wet (e.g. steam and liquid media) post-cure. Wet post-cure can typically be achieved during return to service, provided that the temperature ramp rate does not exceed 54°F (30°C) per hour.

If immediate exposure to aggressive media is to occur prior to achieving a 'full service' cure, post-cure is recommended. Please contact your Belzona representative to discuss specific requirements.

Coated equipment can be transported after the material has achieved the 'inspection' level of cure.

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

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.

Nothing in the foregoing statement shall exclude or limit any liability of Belzona to the extent such liability cannot by law be excluded or limited.

Copyright © 2012 Belzona International Limited. Belzona® is a registered trademark.

ISO 9001:2008
Q 09335
ISO 14001:2004
EMS 509612
Manufactured under an ISO 9000 Registered Quality Management System

Printed in England Publication No. 17-08-12