Belzona Marine Emergency Repair Kit

INSTRUCTIONS FOR USE

1. TO ENSURE AN EFFECTIVE MOLECULAR WELD

APPLY ONLY TO CLEAN, FIRM, DRY AND WELL ROUGHENED 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). Use a flame to sweat out oil from deeply impregnated surfaces.
b) Roughen surfaces by blast cleaning, deeply scoring or grinding
c) Stabilize cracks by drilling the extremities. Long cracks should be drilled, tapped and bolted every 3-4 inches.
d) Vee-out all cracks using a rotary file.
e) Finally degrease again. Use clean rags to avoid spreading contamination.

WHERE BELZONA® METAL 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. PLUGGING ALL LEAKS

USE BELZONA® 1291 TO SEAL LIVE LEAKS
Cut off the required amount of material and knead with fingers to a uniform grey colour. Mixing is aided by storing the material between 20 - 25°C.

WORKING LIFE
From commencement of mixing, **Belzona® 1291** should be used within approximately 4 minutes.

APPLYING BELZONA® 1291
Force the mixed material into cracks and holes and apply pressure until the material has hardened. This is best achieved using the Belzona® Tourniquet provided. Peel away the Velcro fastener and unroll the rubber strip. Whilst pressing the inward curving end of the rubber strip onto the **Belzona® 1291,** stretch the Tourniquet tightly around the repair ensuring each wrap overlaps approximately half way over the previous wrap. Secure with the Velcro fastener.

After approximately 1 hour remove the Tourniquet and apply **Belzona® Marine Metal** or **Belzona® 1221** to secure the repair.

3. COMBINING THE REACTIVE COMPONENTS

BELZONA® MARINE METAL

Stir the contents of the Solidifier container thoroughly to reincorporate any separation. Transfer an equal volume of Base and Solidifier on to the Belzona® Working Surface and mix thoroughly to achieve a uniform material free of any streakiness.

MIXING AT LOW TEMPERATURES
To ease mixing when the material temperature is below 41°F (5°C), warm the Base and Solidifier tins until the contents attain a temperature of 68 - 77°F (20 - 25°C).

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

Temperature	41°F (5°C)	59°F (15°C)	77°F (25°C)
Use all material within	90 min.	60 min.	35 min.

VOLUME CAPACITY OF MIXED BELZONA® MARINE METAL
23.5 cu. in. (385 cm³) per kg.

BELZONA® 1221 (SUPER E-METAL)

Cut off one end of both the Base and Solidifier sachets as close as possible to the seal. Using the straight edge of a mixing spatula or other suitable mixing tool squeeze out the entire contents of the sachets onto the Belzona® Working Surface and mix the two components thoroughly to achieve a uniform material free of any streakiness.

MIXING AT LOW TEMPERATURES
To ease mixing when the material temperature is below 41°F (5°C), warm the Base and Solidifier sachets until the contents attain a temperature of 68 - 77°F (20 - 25°C).

WORKING LIFE
From the commencement of mixing, **Belzona® 1221** must be used within the times shown below.

Temperature	41°F (5°C)	59°F (15°C)	77°F (25°C)
Use all material within	5 min.	4 min.	3 min.

MIXING SMALL QUANTITIES
Smaller quantities of **Belzona® 1221** can be used by mixing together equal volumes of Base and Solidifier. Using the spatula provided squeeze out an equivalent amount of material from each sachet leaving unused material at the closed end. The open end of the sachet should then be folded over and carefully sealed prior to re-use which should be as soon as possible.

VOLUME CAPACITY OF MIXED BELZONA® 1221
33.5 cu. in. (550 cm³) per kg.

4. APPLYING BELZONA® METAL

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.

Apply the **Belzona® Metal** directly on to the prepared surface with the plastic spatula or applicator provided. Press down firmly to fill all cracks, remove entrapped air, and ensure maximum contact with the surface.

Over cracks, gaps, and holes sealed with **Belzona® 1291**, spread the **Belzona® Metal** on to the **Belzona® 9341** (Reinforcement Tape) and apply the bandage to the area to be repaired with the coated side adjacent to the substrate.

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In the case of pipes, wrap tightly round several times so that the **Belzona® Metal** is forced through to the outside of the **Belzona® 9341.**

Apply a final coat of **Belzona® Metal** on top of the **Belzona® 9341.** Contour the **Belzona® Metal** to the correct profile with the plastic applicator or alternatively allow to cure and then machine down.

When **Belzona® Metal** is being used as an irregular shim, offer the two mating surfaces together as soon as **Belzona® Metal** has been applied. Remove excess with the spatula.

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

5. COMPLETION OF THE MOLECULAR REACTION

Allow the **Belzona® Metal** to solidify as below before subjecting it to the conditions indicated. These times are for a thickness of approximately 0.25 in (6 mm); they will be reduced for thicker sections and extended for thinner sections.

BELZONA® MARINE METAL

Temper-ature	Movement or use involving no loading or immersion	Machining and / or light loading	Full mechanical or thermal loading	Immersion in chemicals
41°F/ 5°C	28 hours	4 days	10 days	24 days
50°F/10°C	15 hours	2 days	5 days	12 days
59°F/15°C	9 hours	27 hours	3 days	7 days
68°F/20°C	4¾ hours	16 hours	1½ days	4 days
77°F/25°C	2½ hours	9 hours	1 day	2½ days
86°F/30°C	1½ hours	5 hours	16 hours	1½ days

BELZONA® 1221 (SUPER E-METAL)

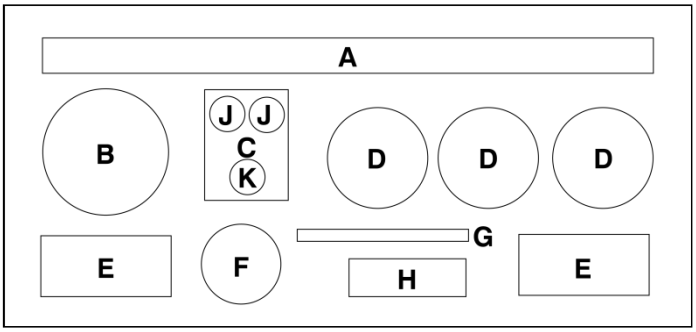
Temper-ature	Movement or use involving no loading or immersion	Machining and / or light loading	Full mechanical or thermal loading	Immersion in chemicals
41°F/ 5°C	17 mins	60 mins	120 mins	48 hours
50°F/10°C	16 mins	50 mins	100 mins	36 hours
59°F/15°C	15 mins	45 mins	90 mins	30 hours
68°F/20°C	14 mins	40 mins	75 mins	24 hours
77°F/25°C	13 mins	35 mins	60 mins	20 hours
86°F/30°C	12 mins	30 mins	45 mins	16 hours

6. APPLICATION OF A FURTHER LAYER OF BELZONA® METAL

If a repair involves overcoating of **Belzona® 1221** by **Belzona® Marine Metal**, the surface of the **Belzona® 1221** must be allowed to cure to a stage where its surface can be suitably roughened prior to application of **Belzona® Marine Metal.**

7. BELZONA® MARINE EMERGENCY REPAIR KIT CONTENTS

A : Belzona® Disposable Working Surface Pad, Mixing Spatulas, Instruction Leaflet and Safety Data Sheets.
B : Belzona® 9111 (Cleaner/Degreaser)
C : Belzona® Disposable Gloves
D : Belzona® Marine Metal
E : Belzona® 1221 (Super E-Metal)
F : Belzona® 9411 (Release Agent)
G : Belzona Applicators
H : Belzona® 9341 (Reinforcement Tape)
J : Belzona® 1291
K : Belzona® Tourniquet



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.

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BELZONA®
Repair • Protect • Improve

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