

# Belzona 2221

## FN10144 (MP FLUID ELASTOMER)



### INSTRUCTIONS FOR USE

#### 1. TO ENSURE AN EFFECTIVE MOLECULAR WELD

##### a) SURFACE PREPARATION

###### (i) Metallic Surfaces

Remove all loose surface contamination and degrease with **Belzona® 9111** (Cleaner/Degreaser) or any other suitable cleaner which does not leave a residue, e.g. Methyl ethyl ketone (MEK). Use a flame to sweat out oil from deeply impregnated surfaces.

Grit blast to a minimum 3 mil (75 microns) profile. Where blasting is not practical, thorough mechanical grinding may be considered, except for applications involving tensile loads, such as expansion joints, and all applications involving immersion and/or fluid flow.

###### (ii) Flexible Surfaces (e.g. rubbers)

**NOTE :** **Belzona® 9111** can draw processing oils and waxes to the surface of some rubbers, particularly when new, which then impairs adhesion of **Belzona® 2221**. Test for this on a small area. If, on rubbing with a rag moistened with **Belzona® 9111**, a greasy film appears, the surface should not be degreased, but simply abraded.

Undercut fine edges with a sharp knife and scuff the surface with a rotary wire brush or suitable roughing tool.

Brush away loose contamination and degrease again with **Belzona® 9111**.

###### (iii) Concrete Surfaces

Remove all paint, tar and any other coatings.

Any surface to which **Belzona® 2221** 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 laitance.

###### (iv) GRP & Existing Belzona Surfaces

When using **Belzona® 2221** to coat GRP surfaces, the surface must be abraded using mechanical sanding equipment, followed by conditioning as below.

When using **Belzona® 2221** to overcoat a surface which has been treated with a **Belzona® 1000** Series product (except **Belzona® 1221** (Super E-Metal), the **Belzona® 1000** Series product must first be allowed to fully cure, the surface prepared as outlined in section 1 (a) (i), and **Belzona® 2911** or **Belzona® 2921** applied as outlined in section 1 (b).

Application of **Belzona® 2221** over **Belzona® 1221** can be carried out up to 4 hours after the application of **Belzona® 1221** without the need of any surface treatment other than removal of contamination. When overcoating **Belzona® 1221** after this time, the surface should be abraded, followed by conditioning as in Section 1 (b).

##### b) CONDITIONING

All surfaces must be Conditioned before applying **Belzona® 2221**.

Please see table below for guidance on the recommended Conditioner based on the substrate type and service conditions:

Substrate Type & Service Conditions	Possible Conditioner Choice		
	Belzona® 2911	Belzona® 2921	Belzona® 2941
Metallic surfaces in wet/immersed environments	x	x	✓
Metallic surfaces in dry environments	✓	✓	✓
Flexible surfaces e.g., Rubber in wet/immersed environments	✓	✓	x
Flexible surfaces e.g., Rubber in dry environments	✓	✓	x
Concrete surfaces in wet/immersed environments	x	x	✓
Concrete surfaces in dry environments	✓	✓	✓
GRP and other Belzona coatings in wet/immersed environments	✓	✓	✓✓
GRP and other Belzona coatings in dry environments	✓	✓	✓

- x - Not suitable for use
- ✓ - Suitable for use
- ✓✓ - Best recommendation

Apply a thin, even coat of **Belzona® Conditioner** onto the surface. A brush should be used as a stipple.

##### Practical coverage rate:

**Belzona® 2941** 19.8 sq.ft. (1.83 sq.m) per unit, on metallic substrates.

**Belzona® 2911** and **Belzona® 2921**, 13 sq.ft. (1.25 m<sup>2</sup>) per unit, on smooth substrates. On well roughened rubber substrates this could be reduced by as much as 50%.

The **Belzona® Conditioner** must be touch dry before overcoating with **Belzona® 2221**. This will depend on the **Belzona® Conditioner** selected, prevailing temperature, relative humidity and substrate. At 68°F (20°C) and 50% relative humidity, the touch dry state will be achieved after the times given when applied to a steel surface.

Conditioner	Touch Dry	Max. Overcoating
<b>Belzona® 2911</b>	45 mins	24 hours
<b>Belzona® 2921</b>	75 mins	
<b>Belzona® 2941</b>	8 hours	

##### NOTE:

- i) Relative humidity should be between 30 & 90% and surface temperature at least 5°F (3°C) above dew point during the application and drying of the Conditioner.
- ii) At lower temperatures and humidity, a longer drying time is required.
- iii) These times may be extended when applied to rubber substrates.
- iv) If in doubt leave Conditioner longer to dry but under no circumstances should maximum overcoat time be exceeded.

**NOTE:** **Belzona® 2911** has an 18 month shelf life and **Belzona® 2921 & Belzona® 2941** have a 24 month shelf life from date of manufacture when stored at 41 - 77°F (5 - 25°C) and must be used before the stated "use by" date.

## WHERE BELZONA® 2221 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

Complete mixing is the most important step in the use of **Belzona® 2221**.

- Empty the entire contents of the Base and Solidifier containers into the mixing bowl provided.
- Mix together for at least 2 minutes until the material is of an even colour and consistency.

### NOTES:

#### 1. MIXING AT LOW TEMPERATURES

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

#### 2. WORKING LIFE

From the commencement of mixing, **Belzona® 2221** must be used within the times shown below:

Temperature	50°F (10°C)	68°F (20°C)	86°F (30°C)	104°F (40°C)
Use all material within	25 min.	15 min.	10 min.	7 min.

#### 3. MIXING SMALL QUANTITIES

Whenever possible, complete units of **Belzona® 2221** should be mixed.

Where small quantity mixes are required, mix

- 3.0 parts Base: 1 part Solidifier by Volume or
- 2.3 parts Base: 1 part Solidifier by Weight.

It is important that these mixing ratios are accurately adhered to. After using part of the Base component the lid should be replaced immediately to minimise the risk of skinning.

#### 4. VOLUME CAPACITY OF MIXED BELZONA® 2221

40.3 cu.in. (661 cm<sup>3</sup>) per 750 g unit.

## 3. APPLYING THE BELZONA® 2221

### FOR BEST RESULTS

#### Do not apply when:-

- The temperature is below 41°F (5°C) or the relative humidity is above 90%.
- Rain, snow, fog or mist is present.
- There is moisture on the surface or is likely to be deposited by subsequent condensation.
- The working environment is likely to be contaminated by oil/grease from adjacent equipment or smoke from kerosene heaters or tobacco smoking.

#### a) Resurfacing

Apply the **Belzona® 2221** to the prepared surface with a stiff bristle brush or the plastic applicator provided to give a coverage rate of approximately 18.9 sq.ft. (1.76m<sup>2</sup>)/750g unit at 15 mils (375µm) thickness.

#### b) Casting

- Brush a thin coat of **Belzona® 2221** onto the inside of the mould previously treated with **Belzona® 9411**.
- Pour the remaining **Belzona® 2221** into the mould, avoiding air entrapment and then remove any occluded air by vibrating the mould.

### CLEANING

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

## 4. COMPLETION OF THE MOLECULAR REACTION

Allow **Belzona® 2221** to solidify as below before subjecting it to the conditions indicated:

	Light loading	Full mechanical loading	Immersion in chemicals
50°F/10°C	24 hours	72 hours	5 days
68°F/20°C	12 hours	36 hours	3 days
86°F/30°C	9 hours	32 hours	2.5 days
104°F/40°C	6 hours	28 hours	2 days

These times are for a thickness of approximately 0.10 ins (0.25 cm); they will be reduced for thicker sections and extended for thinner sections.

## 5. STORAGE

Once opened, **Belzona® 2221** will have a limited shelf life of 6 months under normal conditions of storage in correctly sealed containers. A surface skin may result during this period but after removal the remaining material can be used in the normal way.

Containers should be stored in a dry environment at a temperature of not more than 86°F (30°C).

## 6. OVERCOATING

Application of subsequent layers of **Belzona® 2221** can be carried out without need of any surface treatment other than removal of contamination in accordance with the below maximum overcoat times:

Temperature	<50% Relative humidity	>50% Relative humidity
10°C/50°F	32 hrs	24 hrs
20°C/68°F	16 hrs	12 hrs
30°C/86°F	12 hrs	9 hrs
40°C/104°F	10 hrs	6 hrs

If the maximum overcoat time is exceeded or for overcoating of aged or weathered **Belzona® 2221**, the surface preparation techniques for flexible surfaces described in Section 1 should be followed.

## HEALTH & SAFETY INFORMATION

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

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