

# PRODUCT SPECIFICATION SHEET

## BELZONA 1212

FN 10174



### GENERAL INFORMATION

**Product Description:**

Two component, fast curing, surface tolerant repair paste used as an emergency repair and rebuild system for machinery and equipment. Ideal for use as a high strength structural bonding adhesive or for the creation of irregular load bearing shims.

**Application Areas:**

When mixed and applied as detailed in the Belzona Instructions for Use (IFU), the system is ideally suited for application to damp and oil contaminated surfaces. In addition, the material can be applied underwater.

### APPLICATION INFORMATION

**Application Methods**

Plastic applicator and spatula

**Application Temperature**

Application should ideally occur in the following ambient temperature range: 41°F/5°C to 104°F/40°C

**Volume Capacity**

The volume capacity of mixed material is 12.9 in<sup>3</sup> / 212 cm<sup>3</sup> per 450g unit.

**Cure Time**

Cure times will vary depending on the ambient conditions. At 68°F/20°C, and a thickness of 0.25 in / 6 mm, mechanical loading is possible after 90 minutes. Consult the Belzona IFU for specific details.

**Working Life**

The working life will vary according to the temperature. At 68°F/20°C, the usable life of mixed material will typically be 9 minutes, consult the Belzona IFU for specific details.

**Base Component**

Colour: Black  
Form: Paste  
Density: 1.93 g/cm<sup>3</sup>  
Gel Strength (QH paddle): 127 g/cm

**Solidifier Component**

Colour: Light Grey  
Form: Paste  
Density: 2.32 g/cm<sup>3</sup>  
Gel Strength (QH paddle): 182 g/cm

**Mixed Properties**

Mixing Ratio by Weight (Base : Solidifier) 5 : 6  
Mixing Ratio by Volume (Base : Solidifier) 1 : 1  
Colour: Grey  
Mixed Form: Paste  
Mixed Density: 2.12 g/cm<sup>3</sup>  
Slump Resistance: >0.5 in / >12.7 mm  
VOC (ASTM D2369): 0.06 % / 1.29 g/L

*The above application information serves as introductory guide only. For full application details including the recommended application procedure/technique, refer to the Belzona IFU which is enclosed with each packaged product.*

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#### ABRASION

##### Taber

When determined in accordance with ASTM D4060 the sliding Taber abrasion resistance will be:

**Dry** (CS17 Wheels)  
54 mm<sup>3</sup> loss per 1000 cycles (7 day cure at 68°F/20°C)

**Wet** (H10 Wheels)  
1061 mm<sup>3</sup> loss per 1000 cycles (7 day cure at 68°F/20°C)

#### ADHESION

##### Cleavage Adhesion

The Cleavage Adhesion on mild steel substrates, as determined in accordance with ASTM D1062, following a 7 day cure at 68°F/20°C, will typically be:

	Cleavage Adhesion	Failure Mode
Grit Blasted (SSPC-SP10) (ISO 8501-1 Sa2.5)	1680 pli / 295 N/mm	Cohesive
Ground (SSPC-SP11) (ISO 8501-1 St3)	1620 pli / 285 N/mm	Cohesive

##### Pull Off Adhesion

The PosiTest Dolly Pull Off Strength on 10mm thick mild steel, as determined in accordance with ASTM D4541 and ISO 4624, following a 7 day cure at 68°F/20°C, will typically be:

Grit Blasted (SSPC-SP10) (ISO 8501-1 Sa2.5)	Pull Off Adhesion
Clean & Dry	4220 psi / 29.1 MPa
Transformer Oil	4635 psi / 32.0 MPa
Wet	4665 psi / 32.2 MPa
Underwater	1925 psi / 13.3 MPa
Ground (SSPC-SP11) (ISO 8501-1 St3)	Pull Off Adhesion
Clean & Dry	4365 psi / 30.1 MPa
Transformer Oil	4105 psi / 28.3 MPa
Diesel	4430 psi / 30.6 MPa
Gearbox Oil	1880 psi / 13.0 MPa
Crude Oil	2670 psi / 18.4 MPa
Hydraulic Oil	3585 psi / 24.7 MPa
Fully Synthetic Motor Oil	3260 psi / 22.5 MPa
Wet	4100 psi / 28.3 MPa
Underwater	2500 psi / 17.2 MPa

#### ADHESION

##### Pull Off Adhesion

The PosiTest Dolly Pull Off Strength on Lead sheet, 6 mm glass and 10 mm thick glass reinforced epoxy (G.R.E), as determined in accordance with ASTM D4541 and ISO 4624, following a 7 day cure at 68°F/20°C, will typically be:

Substrate	Surface Preparation	Pull Off Adhesion
Lead	Roughing brush	1500 psi / 10.3 MPa
Glass	Solvent clean	1005 psi / 6.9 MPa *
Glass Reinforced	Frost blast	1580 psi / 10.9 MPa **
Epoxy (G.R.E)	Ground	1500 psi / 10.4 MPa **

\*Cohesive failure of glass substrate

\*\*Cohesive failure of G.R.E substrate

##### Tensile Shear Adhesion

The Tensile Shear Adhesion on mild steel substrates, as determined in accordance with ASTM D1002, following a 7 day cure at 68°F/20°C, will typically be:

Substrate	Grit Blasted (SSPC-SP10) (ISO 8501-1 Sa2.5)	Ground (SSPC-SP11) (ISO 8501-1 St3)
Clean & Dry	2615 psi / 18.0 MPa	2575 psi / 17.8 MPa
Transformer Oil	2920 psi / 20.1 MPa	2615 psi / 18.0 MPa
Wet	2170 psi / 15.0 MPa	1970 psi / 13.6 MPa
Underwater	2000 psi / 13.8 MPa	1915 psi / 13.2 MPa

The Tensile Shear Adhesion on various metal substrates, as determined in accordance with ASTM D1002, following a 7 day cure at 68°F/20°C, will typically be:

Substrate	Grit Blasted (SSPC-SP10) (ISO 8501-1 Sa2.5)	Ground (SSPC-SP11) (ISO 8501-1 St3)
Aluminum	1400 psi / 9.7 MPa	1440 psi / 9.9 MPa
Brass	2235 psi / 14.8 MPa	1450 psi / 9.4 MPa
Copper	1855 psi / 12.8 MPa	1825 psi / 12.6 MPa
Stainless Steel	2540 psi / 16.5 MPa	1665 psi / 10.5 MPa
Lead	-	270 psi / 1.9 MPa **

\*\*Preparation with a roughing brush and Tensile failure of Lead

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#### CHEMICAL ANALYSIS

The mixed **Belzona 1212** has been independently analyzed for halogens, heavy metals, and other corrosion-causing impurities, with the following typical results:

Analyte	Total Concentration (ppm)
Fluoride	110
Chloride	552
Bromide	ND (<10)
Sulfur	157
Nitrite	ND (<7)
Nitrate	5
Zinc	11.5
Antimony	19.1
Tin	5.7
Arsenic, Bismuth, Cadmium, Lead, Silver, Mercury, Gallium and Indium	ND (<5.0)
ND : Not Detected	

#### COMPRESSIVE PROPERTIES

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

<b>Compressive Strength (Maximum)</b>	
10935 psi / 75.4 MPa	(24 hour cure at 68°F/20°C)
12375 psi / 85.4 MPa	(7 day cure at 68°F/20°C)
14070 psi / 97.0 MPa	(24 hour post cure at 194°F/90°C)
15230 psi / 105.0 MPa	(7 day post cure at 194°F/90°C)
<b>Compressive Strength (Yield)</b>	
8590 psi / 59.2 MPa	(24 hour cure at 68°F/20°C)
10010 psi / 69.0 MPa	(7 day cure at 68°F/20°C)
10405 psi / 71.8 MPa	(24 hour post cure at 194°F/90°C)
10955 psi / 75.5 MPa	(7 day post cure at 194°F/90°C)
<b>Compressive Modulus</b>	
1.61 x 10 <sup>5</sup> psi / 1113 MPa	(24 hour cure at 68°F/20°C)
1.73 x 10 <sup>5</sup> psi / 1192 MPa	(7 day cure at 68°F/20°C)
1.78 x 10 <sup>5</sup> psi / 1229 MPa	(24 hour post cure at 194°F/90°C)
1.69 x 10 <sup>5</sup> psi / 1165 MPa	(7 day post cure at 194°F/90°C)

#### CORROSION RESISTANCE

##### Salt Spray

When tested in accordance with ASTM B117, the material shows no visible signs of corrosion after 12 months continuous exposure.

#### ELONGATION & TENSILE PROPERTIES

When determined in accordance with ASTM D638, typical values will be:

<b>Tensile Strength (Maximum)</b>	
3625 psi / 25.0 MPa	(24 hour cure at 68°F/20°C)
3905 psi / 26.9 MPa	(7 day cure at 68°F/20°C)
5085 psi / 35.1 MPa	(7 day post cure at 194°F/90°C)
<b>Tensile Strength (Yield)</b>	
1825 psi / 12.6 MPa	(24 hour cure at 68°F/20°C)
2495 psi / 17.2 MPa	(7 day cure at 68°F/20°C)
3175 psi / 21.9 MPa	(7 day post cure at 194°F/90°C)
<b>Elongation</b>	
0.67 %	(24 hour cure at 68°F/20°C)
0.60 %	(7 day cure at 68°F/20°C)
0.76 %	(7 day post cure at 194°F/90°C)
<b>Young's Modulus</b>	
7.48 x 10 <sup>5</sup> psi / 5156 MPa	(24 hour cure at 68°F/20°C)
7.25 x 10 <sup>5</sup> psi / 5003 MPa	(7 day cure at 68°F/20°C)
7.45 x 10 <sup>5</sup> psi / 5135 MPa	(7 day post cure at 194°F/90°C)

#### FLEXURAL PROPERTIES

When determined in accordance with ASTM D790, typical values will be:

<b>Flexural Strength (Maximum)</b>	
8905 psi / 61.4 MPa	(24 hour cure at 68°F/20°C)
9790 psi / 67.5 MPa	(7 day cure at 68°F/20°C)
11215 psi / 83.0 MPa	(7 day post cure at 194°F/90°C)
<b>Flexural Strength (Yield)</b>	
5160 psi / 35.6 MPa	(24 hour cure at 68°F/20°C)
6285 psi / 43.4 MPa	(7 day cure at 68°F/20°C)
7375 psi / 50.9 MPa	(7 day post cure at 194°F/90°C)
<b>Flexural Modulus</b>	
6.69 x 10 <sup>5</sup> psi / 4612 MPa	(24 hour cure at 68°F/20°C)
7.41 x 10 <sup>5</sup> psi / 5109 MPa	(7 day cure at 68°F/20°C)
7.97 x 10 <sup>5</sup> psi / 5469 MPa	(7 day post cure at 194°F/90°C)

#### HARDNESS

The Shore D and Barcol hardness, when determined in accordance with ASTM D2240 and ASTM D2583 (Model No.935) respectively, will typically be:

	Shore D	Barcol
24 hour cure at 68°F/20°C	82	81
7 day cure at 68°F/20°C	84	82
7 day post cure at 194°F/90°C	86	83

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#### HEAT RESISTANCE

##### Heat Distortion (HDT)

The HDT when determined in accordance with ASTM D648, will typically be:

Cure	HDT
24hrs at 68°F/20°C	111°F/44°C
7 days at 68°F/20°C	120°F/49°C
24 hour post cure at 194°F/90°C	147°F/64°C
7 day post cure at 194°F/90°C	153°F/67°C

##### Dry Heat Resistance

The indicated degradation temperature in air based on Differential Scanning Calorimetry (DSC) operated in accordance with ISO11357 is typically 392°F (200°C).

For many applications the product is suitable down to -40°F (-40°C).

#### IMPACT RESISTANCE

##### Izod Pendulum

Izod impact strength, when determined in accordance with ASTM D256, will typically be:

Notched:	4.17 KJ/m <sup>2</sup>	(7 day cure at 68°F/20°C)
	4.76 KJ/m <sup>2</sup>	(7 day post cure at 194°F/90°C)
Un-notched:	5.07 KJ/m <sup>2</sup>	(7 day cure at 68°F/20°C)
	5.07 KJ/m <sup>2</sup>	(7 day post cure at 194°F/90°C)

#### SHELF LIFE

Separate base and solidifier components shall have a shelf life of 5 years from date of manufacture when stored in their original unopened containers between 32°F (0°C) and 86°F (30°C).

#### WARRANTY

Belzona guarantees this product will meet the performance claims stated herein when material is stored and used as instructed in the Belzona Information 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, ISO etc.). Since Belzona has no control over the use of the product described herein, no warranty for any application can be given.

#### AVAILABILITY AND COST

**Belzona 1212** will be 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.

#### MANUFACTURER

Belzona Polymerics Ltd.  
Claro Road, Harrogate,  
HG1 4DS, UK

Belzona Inc.  
2000N.W. 88<sup>th</sup> Court,  
Miami, Florida, USA, 33172

#### HEALTH AND SAFETY

Prior to using this material, please consult the relevant Material Safety Data Sheets.

#### TECHNICAL SERVICE

Complete technical assistance is available and includes fully trained Technical Consultants, technical service personnel and fully staffed research, development and quality control laboratories.

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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