

PRODUCT SPECIFICATION SHEET

BELZONA 1212

FN10174



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 in³ / 212 cm³ 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/cm³
Gel Strength (QH paddle): 127 g/cm

Solidifier Component

Colour: Light Grey
Form: Paste
Density: 2.32 g/cm³
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/cm³
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 mm³ loss per 1000 cycles (7 day cure at 68°F/20°C)

Wet (H10 Wheels)
1061 mm³ 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 Epoxy (G.R.E)	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 analysed for halogens, heavy metals, and other corrosion-causing impurities, in accordance with ASTM E165, ASTM D4327 and ASTM E1479. Typical results are displayed as follows:

Analyte	Total Concentration (ppm)
Fluoride	110
Chloride	552
Bromide	ND (<10)
Sulphur	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:

	Compressive Strength	Proportional Limit	Youngs Modulus
24 hour 68°F/20°C cure & test	71.7 MPa 10,395 psi	60.0 MPa 8,695 psi	1,344.7 MPa 1.95 x 10 ⁵ psi
68°F/20°C cure & test	88.7 MPa 12,869 psi	75.4 MPa 10,938 psi	1,632.1 MPa 2.37 x 10 ⁵ psi
24 hour 194°F/90°C & 68°F/20°C test	104.6 MPa 15,172 psi	89.1 MPa 12,918 psi	1,533.9 MPa 2.22 x 10 ⁵ psi
194°F/90°C cure & 68°F/20°C test	108.2 MPa 15,691 psi	92.9 MPa 13,474 psi	1,428.0 MPa 2.07 x 10 ⁵ psi

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:

Tensile Strength (Maximum)	
4,598 psi / 31.70 MPa	(24 hour cure at 68°F/20°C)
5,146 psi / 35.48 MPa	(7 day cure at 68°F/20°C)
5,864 psi / 40.43 MPa	(7 day post cure at 194°F/90°C)
Tensile Strength (Yield)	
1,755 psi / 12.10 MPa	(24 hour cure at 68°F/20°C)
1,762 psi / 12.15 MPa	(7 day cure at 68°F/20°C)
2,898 psi / 19.98 MPa	(7 day post cure at 194°F/90°C)
Elongation	
0.57 %	(24 hour cure at 68°F/20°C)
0.68 %	(7 day cure at 68°F/20°C)
0.73 %	(7 day post cure at 194°F/90°C)
Young's Modulus	
1.07 x 10 ⁶ psi / 7,350 MPa	(24 hour cure at 68°F/20°C)
1.05 x 10 ⁶ psi / 7,246 MPa	(7 day cure at 68°F/20°C)
9.90 x 10 ⁵ psi / 6,826 MPa	(7 day post cure at 194°F/90°C)

FLEXURAL PROPERTIES

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

Flexural Strength (Maximum)	
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)
Flexural Strength (Yield)	
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)
Flexural Modulus	
6.69 x 10 ⁵ psi / 4612 MPa	(24 hour cure at 68°F/20°C)
7.41 x 10 ⁵ psi / 5109 MPa	(7 day cure at 68°F/20°C)
7.97 x 10 ⁵ psi / 5469 MPa	(7 day post cure at 194°F/90°C)

HARDNESS

Shore D & Barcol Hardness

The Shore D and Barcol hardness, when determined in accordance with ASTM D2240 and ASTM D2583 respectively, will typically be:

	Shore D	Barcol 934-1	Barcol 935
24 hour cure at 68°F/20°C	82	10	81
7 day cure at 68°F/20°C	84	20	82
7 day post cure at 194°F/90°C	86	31	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

Service Temperature Limits

For many typical applications, the product will be suitable for use at the following service temperatures:

Type of Service	Temperature
Lower temperature limit	-40 °C (-40 °F)
Upper temperature limit (dry)	55 °C (131 °F)
Upper temperature limit (wet)	50 °C (122 °F)

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).

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 41°F (5°C) and 86°F (30°C).

IMPACT RESISTANCE

Izod Pendulum

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

	Reversed notched Izod Impact Strength	Un-notched Izod Impact Strength
24 hour 68°F/20°C cure & test	3.4 KJ/m ² 35.2 J/m	3.9 KJ/m ² 49.7 J/m
68°F/20°C cure & test	5.4 KJ/m ² 54.7 J/m	6.7 KJ/m ² 85.0 J/m
212°F/100°C cure & 68°F/20°C test	4.9 KJ/m ² 48.9 J/m	6.8 KJ/m ² 86.4 J/m

POTABLE WATER APPROVAL

KC

Listed in Barrier Materials as epoxy resin-based waterproof and anticorrosion material, which has passed full test of sanitation and safety.



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WARRANTY

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 ensures that all its products are carefully manufactured to ensure the highest quality possible and are tested strictly in accordance with universally recognized 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.

HEALTH AND SAFETY

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

MANUFACTURER / SUPPLIER

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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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