Product Specification Sheet
Belzona 1121 (Super XL Metal)
FN10224

General Information

Product Description:
A two-component paste grade system with extended working life for repairing and rebuilding machinery and equipment. Based on a silicon steel alloy blended with high molecular weight reactive polymers and oligomers. Also used as a high strength structural adhesive for bonding or for creation of irregular load bearing shims with good electrical insulation characteristics. Once cured, the repair is durable and fully machinable. For use in Original Equipment Manufacture or repair situations.

Application Areas:
When mixed and applied as detailed in the Belzona Instructions for Use (IFU), the system is ideally suited for application to the following:

- Shafts,
- Hydraulic rams
- Bearing housings
- Bushing fits
- Keyways
- Engine blocks
- Casings
- Levelling
- Piping, pipeline, and pipework
- Flange faces

Application Information

Application Methods: Applicator, spatula

Application Temperature: The application should ideally occur from 41 °F to 86 °F (5 °C to 30 °C).

Working Life: The working life will vary according to application temperature. The usable life of mixed material will typically be 30 minutes at 86 °F (30 °C). Consult the Belzona IFU for specific details.

Volume Capacity: 23 in^3/kg (374 cm^3/kg)

Cure Times:
Cure times will vary depending on the ambient conditions and will be reduced for thicker sections and extended for thinner applications. Consult the Belzona IFU for specific details.

Base Component

Appearance	Paste
Color	Dark grey
Gel Strength (4 cm^2 paddle) at 22 °C	300 - 400 g/cm
Density	0.046 – 0.049 kg/in^3 (2.8 – 3.0 g/cm^3)

Solidifier Component

Appearance	Paste
Color	Light grey
Gel Strength (8 cm^2 paddle) at 22 °C	130 – 200 g/cm
Density	0.039 – 0.043 kg/in^3 (2.4 – 2.6 g/cm^3)

Mixed Properties

Mixing Ratio by Weight (Base: Solidifier)	1.2: 1
Mixing Ratio by Volume (Base: Solidifier)	1: 1
Mixed Form	Paste
Peak Exotherm Temperature	86 - 104 °F (30 - 40 °C)
Time to Peak Exotherm	60 – 80 min.
Mixed Density	0.043 – 0.044 kg/in^3 (2.6 – 2.7 g/cm^3)
Slump Resistance	Nil at 1.0 in. (2.5 cm)
VOC Content (ASTM D2369/EPA Ref. 24)	0.05% (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 tested in accordance with ASTM D4060 (1-kg load), the sliding abrasion of samples cured under the conditions stated below (per 1,000 cycles) will typically be:

CS17 Wheels (Dry)	66 mm^3 loss – 72 °F (22 °C) cure
H10 Wheels (Wet)	1,345 mm^3 loss – 72 °F (22 °C) cure

Adhesion

Cleavage
When tested in accordance with ASTM D1062, the cleavage adhesion of Belzona 1121 applied onto samples abrasive-blasted to an average surface profile of 3 mil (75 µm) and cured at 72 °F (22 °C) for 7 days will typically be:

Carbon steel	1,050 lbf/in. (18.8 kgf/mm)

Tensile Shear
When tested in accordance with ASTM D1002, the tensile shear of Belzona 1121 applied onto samples abrasive-blasted to an average surface profile of 3 mil (75 µm) and cured at 72 °F (22 °C) for 7 days will typically be:

Aluminum	2,500 psi (17.2 MPa)
Carbon steel	3,500 psi (24.1 MPa)
Copper	2,600 psi (17.9 MPa)

Pull Off
When tested in accordance with ASTM D4541/ISO 4624, the pull-off adhesion of Belzona 1121 applied onto steel samples blasted to an average surface profile of 3 mil (75 µm) and cured at 72 °F (22 °C) for 7 days will typically be:

2,800 psi (19.3 MPa)

Chemical Analysis

The mixed Belzona 1121 has been independently analyzed 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	205
Chloride	251
Bromide	< 49
Sulfur	18,877
Nitrile	< 6
Nitrate	< 10
Zinc	7
Antimony, Arsenic, Bismuth, Cadmium, Lead, Tin, Silver, Mercury, Gallium, and Indium	ND (< 4)

ND: Not Detected

Chemical Resistance

When fully cured, the material will demonstrate excellent resistance to a broad range of chemicals. For a more detailed description of chemical resistance properties, refer to relevant Chemical Resistance chart.

Compressive Properties

When tested in accordance with ASTM D695, the compressive properties of samples cured at 72 °F (22 °C) for 7 days will typically be:

Compressive Strength
9,000 psi (62.0 MPa)

Compressive Modulus
4.6 x 10^5 psi (3.2 GPa)

Corrosion Protection

Upon full curing at 72 °F (22 °C) for 7 days, Belzona 1121 will show no visible signs of corrosion after 1,000 hours of salt spray exposure in accordance with ASTM B117.

Flexural Properties

When tested in accordance with ASTM D790, the flexural strength and strain-at-break of samples cured at 72 °F (22 °C) for 7 days will typically be:

Flexural Strength
7,000 psi (48.3 MPa)

Flexural Strain at Break
0.62%

Hardness

Barcol
When tested in accordance with ASTM D2583 and using a Barcol impressor Model No. 935, the hardness of samples cured at 72 °F (22 °C) for 7 days will typically be:

85

Shore D
When tested in accordance with ASTM D2240, the Shore D hardness of samples cured at 72 °F (22 °C) for 7 days will typically be:

85

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Heat Resistance

Glass Transition Temperature (T_g)
When tested to ISO 11357-2, T_g of samples cured at 72 °F (22 °C) for 7 days will typically be:

130 °F (54 °C)

Service Temperature Limits
For many 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)	60 °C (140 °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 ISO 11357 is typically 392 °F (200 °C).

Impact Resistance

Izod Pendulum
When tested in accordance with ASTM D256, the impact (un-notched) resistance of samples cured at 72 °F (22 °C) for 7 days will typically be:

1.23 ft-lb/in (65.9 J/m)

Tensile Properties

When determined in accordance with ASTM D638, typical values of samples cured and tested at 72 °F (22 °C) for 7 days will be:

Ultimate Tensile Strength	3,185 psi (22.0 MPa)
Young's Modulus	7.9 x 10^5 psi (5.4 GPa)

Approvals

American Bureau of Shipping

Belzona 1121 holds "Product Type Approval" by ABS under certificate number 23-2426036-PDA.

Contact Belzona for more details on these approvals or any other approvals or certifications not stated herein.

Shelf Life

Separate base and solidifier components shall have a shelf life of five (5) years from date of manufacture when stored in their original unopened containers between 41 °F (5 °C) and 86 °F (30 °C).

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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 (IFU) leaflet.

Belzona further guarantees that all its products are carefully manufactured to ensure the highest quality possible and 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 1121 is 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 Material Safety Data Sheets.

Manufacturer/Supplier

Belzona Polymerics Limited
Claro Road
Harrogate HG1 4DS
United Kingdom

Belzona, Inc.
14300 NW 60th Ave,
Miami Lakes, FL, 33014, USA

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.

Belzona products are manufactured under an ISO 9001 registered Quality Management System.