BELZONA® World leaders in the conservation of man-made resources and the environment

PRODUCT SPECIFICATION SHEET

BELZONA® 1221

1. PRODUCT NAME

Belzona® 1221
(Super E-Metal)
A rapidly solidifying repair system for emergency and permanent bonding, repairing or rebuilding of all ferrous and non-ferrous metals.

NSF Certified to ANSI/NSF 61

2. MANUFACTURER

Belzona Inc.,
2000 N.W. 88th Court
Miami, Florida 33172

Belzona Polymerics Ltd.,
Claro Road, Harrogate,
HG1 4AY, England.

3. PRODUCT DESCRIPTION

A two component system consisting of a base and solidifier is packaged in sealed sachets. The product is based on a silicon steel alloy blended within high molecular weight polymers and oligomers. Developed for high speed emergency repairs it is ideally suited for applciation to:

Leaking pipes
Leaking tanks
Scored hydraulic rams
Stripped threads
Plastic/metal joints
Holed casings
Bearing seats
Battery terminal posts
Broken insulators
Ducts

4. TECHNICAL DATA

Base Component

Appearance	Paste
Color	Dark gray
Gel strength at 77°F (25°C)	100 - 300 g/cm
Density	2.20 - 2.40 g/cm^3

Solidifier Component

Appearance	Paste
Color	White
Gel strength at 77°F (25°C)	50 - 150 g/cm
Density	1.10 - 1.30 g/cm^3

Mixed Properties

Mixing Ratio by Weight (Base : Solidifier)	2 : 1
Mixing Ratio by Volume (Base : Solidifier)	1 : 1
Mixed Density	1.70 - 1.90g/cm^3

• *Shelf Life:*

Unopened sachets stored between 32°F (0°C) and 86°F (30°C) are expected to have a 5 year shelf life. Once opened, material shelf life will be several weeks.

• *Working Life:*

Will vary according to temperature. At 77°F (25°C) use all mixed material within 3 minutes.

• *Volume Capacity:*

The volume capacity for the material is 33.5 cu.in (550 cm^3) per kg. The unit size is 125g.

• *Cure Time:*

Will be reduced for thicker sections and extended for thinner applications. At a thickness of approximately ¼ in. (6 mm), allow to solidify for the times shown in the chart below before subjecting it to the conditions indicated.

5. PHYSICAL / MECHANICAL PROPERTIES

• *Adhesion:*

Tensile Shear
The tensile shear adhesion to a grit blasted substrate with a 3 - 4 mil. profile, when tested to ASTM D1002 after 7 days cure at 77°F (25°C), is typically

Mild steel	2500 psi (175 kgs/cm^2)
Copper	1800 psi (126 kgs/cm^2)
Aluminum	1500 psi (105 kgs/cm^2)

• *Chemical Resistance:*

The material when allowed to cure for 7 days at 77°F (25°C) prior to immersion, will offer excellent resistance to the following chemicals:

ACIDS
10% hydrochloric
20% Sulfuric
10% Nitric
10% Phosphoric
10% Acetic
10% Lactic

BASES
40% Sodium hydroxide

OTHERS
Diethanolamine
Sodium hypochlorite (bleach)
Kerosine
Gasoline
37% Formalin

• *Compressive Strength:*

The compressive strength of the material, when tested to ASTM D695 after 7 days cure at 77°F (25°C), is typically 8100 psi (570 kgs/cm^2).

CURE TIMES

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

• *Corrosion Resistance:*

When fully cured, the material will show no visible signs of corrosion after 5,000 hours exposure in the ASTM B117-73 salt spray cabinet.

• *Electrical Properties:*

Dielectric Strength
218 volts/mil (8720 volts/mm)

Dielectric Constant	
at 1000HZ	4
at 1 MHZ	4
Dissipation Factor	
at 1000 HZ	< 0.0005
at 1 MHZ	< 0.0005
Volume Resistivity	
(ohm cm)	6.3×10^{15}
Surface Resistivity	
(ohms)	1.5×10^{15}

• *Flexural Strength:*

The flexural strength of the material, when tested to ASTM D790 after 7 days at 77°F (25°C), is typically 8600 psi (605 kgs/cm^2).

• *Heat Distortion Temperature:*

The heat distortion temperature of the material, when tested to ASTM D648 (264 psi fiber stress) after 7 days at 77°F (25°C), is typically 124°F (51°C).

• *Hardness:*

The hardness of the material when tested to ASTM D2240 after 7 days cure at 77°F (25°C), is typically 80 Shore D.

• *Thermal Expansion:*

Tested to ASTM E228 the coefficient of thermal expansion is typically 81.5 ppm/°C.

• *Water Uptake:*

When tested for 3 days at 77°F (25°C) water uptake is typically 1%.

6. SURFACE PREPARATION AND APPLICATION PROCEDURES

For proper technique, refer to the Belzona Instructions for Use leaflet which is enclosed with each packaged product.

7. AVAILABILITY AND COST

Belzona® 1221 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.

8. WARRANTY

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

9. TECHNICAL SERVICES

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

10. HEALTH AND SAFETY

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

11. APPROVALS/ ACCEPTANCES

ABS
U.S.D.A.
NUCLEAR POWER INDUSTRY
(DBA Tested)
NSF
NATO
G.E. NUCLEAR ENERGY
FORD

Belzona Polymerics Ltd.,
Claro Road,
Harrogate, HG1 4AY,
England.
Tel: +44 (0) 1423 567641
Fax:+44 (0) 1423 505967
E-Mail: Belzona@belzona.co.uk

Belzona Inc.,
2000 N.W. 88 Court,
Miami, Florida 33172,
U.S.A.
Tel: +1 (305) 594 4994
Fax:+1 (305) 599 1140
E-Mail: Belzona@belzona.com

BS EN ISO 9002 : 1994
Certificate No. Q/09335

www.belzona.com

Printed in England 09/01 UK