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

PRODUCT SPECIFICATION SHEET
BELZONA® 1321

1. PRODUCT NAME
Belzona® 1321
(Ceramic S-Metal)
Repair system designed for surfacing metals attacked by erosion-corrosion.

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 non-machineable grade material based on a silicon-steel alloy blended within high molecular weight reactive polymers and oligomers. The system is designed for resurfacing metals and offers protection against the effects of erosion-corrosion in fluid flow systems. Available in two colors, blue and gray.

Applications
Centrifugal and turbine pumps.
Heat exchangers, water box ends, division bars and tube sheets.
Butterfly and gate valves.
Propellers.
Kort nozzles.
Pipe elbows.
T-pieces.

4. TECHNICAL DATA
Base Component

Appearance	Paste
Color	Gray
Density	2.60 - 2.80 g/cm³

Solidifier Component

Appearance	Liquid
Color	Blue or Violet
Density	1.00 - 1.08 g/cm³

Mixed Properties

Mixing Ratio by Weight (Base : Solidifier)	11 : 1
Mixing Ratio by Volume (Base : Solidifier)	4 : 1
Mixed Form	Liquid
Peak Exotherm Temperature	158 - 185°F (70 - 85°C)
Time to Peak Exotherm	53 - 63 mins.
Slump Resistance	nil at 25 mil (625 microns)
Mixed Density	2,35 - 2.45 g/cm³

• *Shelf Life:*
Separate base and solidifier components will have a 5 year shelf life when stored between 32°F (0°C) and 86°F (30°C).

• *Working Life:*
Will vary according to temperature. At 77°F (25°C) the usable life of mixed material is 30 minutes.

• *Coverage Rate:*
Each 1 kg. unit applied at the correct film thickness of 10 - 15 mils. (250 - 375 microns) will cover approximately 11 sq.ft. (1.0 sq.m.).

• *Volume Capacity:*
The volume capacity of mixed material is 25.7 cu.ins. (425 cm³) per kilogram.

• *Cure Time:*
Allow to solidify for the times shown in the chart below before subjecting it to the conditions indicated.

5. PHYSICAL / MECHANICAL PROPERTIES
Determined after 7 days cure at 77°F (25°C). Post curing the material with heat results in a more highly cross-linked polymer.

For enhanced performance this material may be post-cured by heating to 212°F (100°C) for a period of up to 24 hours. This should be carried out following an initial cure period of 24 hours at ambient temperature.

• *Abrasion Resistance:*
Taber
The Taber abrasion resistance with 1 kg load is typically:
H10 Wheels (Wet) 172 mm³
CS17 Wheels (Dry) 55 mm³
loss per 1000 cycles

• *Adhesion:*
Tensile Shear
When tested in accordance with ASTM D1002, using degreased substrates which have been grit blasted to a 3 - 4 mil. profile give typical values of,

Mild steel	2,900 psi (204 kgs/cm²)
Brass	2,200 psi (155 kgs/cm²)
Copper	2,400 psi (168 kgs/cm²)
Stainless steel	3,000 psi (211 kgs/cm²)
Aluminium	2,000 psi (140 kgs/cm²)

• *Cathodic Disbondment:*
When tested in accordance with ASTM G8 a rating Class B is obtained.

• *Chemical Resistance:*
Once fully cured, the material will demonstrate excellent resistance to the following chemicals;

carbonic acid
10% hydrobromic acid
20% hydrochloric acid
10% nitric acid
20% nitrous acid
5% phosphoric acid
10% sulfuric acid
Citric acid
10% ammonia solution

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	12 hrs	8 hrs	51/2 hrs	4 hrs	3½ hrs	2 hrs
Machining and/or light loading	18 hrs	12 hrs	9 hrs	6 hrs	4½ hrs	3 hrs
Full mechanical/thermal loading or water immersion	7 days	3 days	2 days	1½ days	24 hrs	18 hrs
Chemical contact	10 days	5 days	3 days	2 days	1½ days	1 day

lime water
40% potassium hydroxide
40% sodium hydroxide
propanol
butanol
ethylene glycol
diethanolamine
methylamine (25% in water)
hydrocarbons
mineral oils
inorganic salts

* *For a more detailed description of chemical resistance properties, refer to Product Data M501.*

• *Compressive Strength:*
When tested in accordance with ASTM D695, typical values obtained will be 13,000 psi.

• *Corrosion Resistance:*
Once fully cured, will show no visible signs of corrosion after 5,000 hours exposure in the ASTM B117-73 salt spray cabinet.

• *Electrical Properties:*
Dielectric Constant
Tested to ASTM D150 is typically 12 at 1000Hz.
Tested to ASTM D150 is typically 8 at 1MHz.

Dielectric Strength
Tested to ASTM D149 is typically 33 volts/mil (1320 volts/mm).

Dissipation Factor
Tested to ASTM D150 is typically < 0.0005 at 1000 Hz.
Tested to ASTM D150 is typically < 0.0005 at 1 MHz.

Surface Resistivity
Tested to ASTM D257 is typically 6.7×10^{13} ohm.

Volume Resistivity
Tested to ASTM D257 is typically 3.3×10^{13} ohm cm.

• *Flexural Strength:*
When tested to ASTM D790, typical values obtained will be 10,000 psi.

• *Hardness:*
The hardness of the material when tested to ASTM D2240 is typically 80 Shore D.

• *Heat Distortion Temperature:*
Tested to ASTM D648 (264 psi fiber stress), typical values obtained will be 117°F (47°C) when cured at 20°C and 208°F (98°C) when post cured at 100°C.

• *Heat Resistance:*
The material is stable under dry conditions to continuous exposure to temperatures up to 392°F (200°C). Under wet conditions a standard two-coat system will typically resist 140°F (60°C) while higher temperature resistance (up to 194°F (90°C) at ambient pressures can be achieved using three or more coats.

• *Impact Strength:*
Reverse notched impact strength is typically 0.93 ft. lb/in,. or 50 J/m.

• *Shrinkage:*
0.0% minimum
0.005% maximum

• *Thermal Expansion:*
Tested to ASTM E228 the coefficient of thermal expansion is typically 38.4 ppm/°C.

6. SURFACE PREPARATION AND APPLICATION PROCEDURES
For proper technique, refer to the Instructions For Use Leaflet which is enclosed with each packaged product.

Badly eroded surfaces may first be rebuilt with **Belzona® 1311** (Ceramic R-Metal) prior to applicaiton of **Belzona® 1321.**

7. AVAILABILITY AND COST
Belzona® 1321 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 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 recognized 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
U.S.D.A.
ABS
BUREAU VERITAS
U.K. WRC
NATO
GENERAL MOTORS
TOYOTA
FORD
YORK INTERNATIONAL
RUSSIAN REGISTER OF SHIPPING

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 4/03 UK