PRODUCT SPECIFICATION SHEET
BELZONA 7111
FN10160

BELZONA®
Repair • Protect • Improve

GENERAL INFORMATION

Product Description:
Cost-effective, two-component, 100% solids compound designed for use as a chocking or grouting material to endure the physical and thermal shock common to marine and industrial environments, also exhibits excellent non-shrinking properties, high impact resistance, and compressive strength

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:

- Diesel engines
- Gas engines
- Pumps
- Generators
- Compressors
- Reduction gears
- Bearing blocks
- Crane rails
- Other machinery

APPLICATION INFORMATION

Application Methods:
Casting by pouring

Application Temperature:
The application should ideally occur from 41 °F to 104 °F (5 °C to 40 °C).

Working Life:
The working life will vary according to application temperature. The usable life of mixed material will typically be 30 minutes at 68 °F (20 °C). Consult the Belzona IFU for specific details.

Volume Capacity:
Belzona 7111 should be applied as a chocking or grouting compounds in depths of ½ in. – 4 in. (12 mm – 100 mm). The theoretical volume capacity of Belzona 7111 will be 272 in³ (4,455 cm³) per 6.95-kg unit.

Cure Times:
Cure times will vary depending on the ambient conditions. Consult the Belzona IFU for specific details.

Base Component	
Appearance	Viscous liquid
Colour	Orange
Viscosity at 72 °F (22 °C)	1,600 – 1,700 P
Density	1.59 – 1.65 g/cm³

Solidifier Component	
Appearance	Clear mobile liquid
Colour	Transparent
Viscosity at 72 °F (22 °C)	0.20 – 0.23 P
Density	0.97 g/cm³

Mixed Properties	
Mixing Ratio by Weight (Base: Solidifier)	14.5: 1
Mixed Form	Viscous liquid
Mixed Viscosity at 72 °F (22 °C)	80 - 100 P
Mixed Viscosity at 104 °F (40 °C)	40.7 P
Mixed Density	1.56 g/cm³
VOC Content (ASTM D2369/EPA Ref.24)	5.10 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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ADHESION

Pull Off Adhesion
When tested in accordance with ASTM D4541/ ISO 4624, the pull-off strength of samples cured at 72 °F (22 °C) for 24 hours will typically be:

Dry concrete	980 psi (6.8 MPa)*
Mild steel	3,880 psi (26.8 MPa)

* Cohesive failure of substrate

Tensile Shear Adhesion
When determined in accordance with ASTM D1002, the tensile shear adhesion of samples applied on abrasive-blasted steel and cured at 72 °F (22 °C) for 24 hours will typically be:

Mild steel	3,570 psi (24.6 MPa)
Stainless steel	2,900 psi (20.0 MPa)

COMPRESSIVE PROPERTIES

When determined in accordance with ASTM D695, the compressive properties of cylindrical samples (1.0 in./25.4 mm height) of Belzona 7111 cured at the conditions stated below will typically be:

Compressive Strength

8,100 psi (56 MPa)	41 °F (5 °C) cure for 7 days.
10,400 psi (72 MPa)	50 °F (10 °C) cure for 7 days
15,600 psi (107 MPa)	72 °F (22 °C) cure for 7 days
31,000 psi (214 MPa)	158 °F (70 °C) post-cure for 4 hr.
32,500 psi (224 MPa)	194 °F (90 °C) post-cure for 4 hr.

Limit of Elasticity

5,700 psi (39 MPa)	41 °F (5 °C) cure for 7 days
8,100 psi (56 MPa)	50 °F (10 °C) cure for 7 days
14,200 psi (98 MPa)	72 °F (22 °C) cure for 7 days
19,600 psi (135 MPa)	158 °F (70 °C) post-cure for 4 hr.
25,500 psi (176 MPa)	194 °F (90 °C) post-cure for 4 hr.

Compressive Modulus

1.5 x 10^5 psi (1.0 GPa)	41 °F (5 °C) cure for 7 days
1.7 x 10^5 psi (1.1 GPa)	50 °F (10 °C) cure for 7 days
2.9 x 10^5 psi (2.0 GPa)	72 °F (22 °C) cure for 7 days
2.9 x 10^5 psi (2.0 GPa)	158 °F (70 °C) post-cure for 4 hr.
3.4 x 10^5 psi (2.3 GPa)	194 °F (90 °C) post-cure for 4 hr.

When tested in accordance with BS EN ISO 604, the compressive strength of samples of Belzona 7111 cured at 64 – 70 °F (18 – 21 °C) for 24 hours and post-cured at the conditions stated below will typically be:

30,900 psi (213 MPa)	158 °F (70 °C) post-cure for 16 hr.
25,050 psi (173 MPa)	194 °F (90 °C) post-cure for 16 hr.

CREEP (DEFORMATION) UNDER LOAD

When tested to the requirements of ASTM D621/Lloyd's Register's Rules, Part 2, Chapter 14, Section 3.9.2, samples of Belzona 7111 cured at 72 °F (22 °C) for 24 hours, post-cured at 176 °F (80 °C) for 16 hours, and subjected to compressive loads of 725 psi (5 MPa) for 24 hours, will typically deform:

0.31%

CURING LINEAR SHRINKAGE

When determined in accordance with Lloyd's Register's Rules, Part 2, Chapter 14, Section 3.9.2, the curing linear shrinkage of samples of Belzona 7111 cured under the conditions stated below, will typically be:

0.43%	in running water at 53.2 °F (11.8 °C)
0.16%	cured at 73.5 °F (23 °C)
0.83%	cured at 122 °F (50 °C)

FIRE RESISTANCE

When tested in accordance with ASTM D635, samples of Belzona 7111 cured at 72 °F (22 °C) for 7 days self-extinguished when the source of ignition was removed, and the flame front did not reach or pass the 25-mm reference mark.

FLEXURAL PROPERTIES

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

9,580 psi (66.1 MPa)

Flexural Modulus
When tested in accordance with ASTM D790, the flexural modulus of samples cured at 72 °F (22 °C) for 7 days will typically be:

9.9 x 10^5 psi (6.8 GPa)

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HARDNESS

Barcol
When tested in accordance with ASTM D2583 and using a Barcol impressor Model No. 934-1, the hardness of samples cured at 72 °F (22 °C) for 7 days will typically be:

40

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:

90

HEAT RESISTANCE

Heat Distortion Temperature (HDT)
When tested in accordance with ISO 75, the HDT of samples of Belzona 7111 cured at 72 °F (22 °C) and post-cured at the conditions stated below will typically be:

HDT	Post-Cure Temperature
195.3 °F (90.7 °C)	158 °F (70 °C)
213.8 °F (101 °C)	176 °F (80 °C)

For many typical applications, Belzona 7111 is suitable for operating temperatures within -40 °F (-40 °C) and 176 °F (80 °C).

IMPACT RESISTANCE

Izod Pendulum
When tested in accordance with ASTM D256, the impact (notched) resistance of samples of Belzona 7111 cured at 72 °F (22 °C) for 24 hours will typically be:

2.21 ft-lb/in^2 (4.65 kJ/m^2)

LIQUID ABSORPTION

When tested in accordance with ISO 175, cylindrical samples of Belzona 7111 cured under the conditions stated below and immersed in oil at 73 °F (23 °C) for 24 hours, will typically show a mass gain of:

14.2 mg	158 °F (70 °C) post-cure for 16 hr.
11.8 mg	176 °F (80 °C) post-cure for 16 hr.

When tested in accordance with ISO 62, cylindrical samples of Belzona 7111 cured under the conditions stated below and immersed in distilled water at 73 °F (23 °C) for 24 hours, will typically show a mass gain of:

17.0 mg	158 °F (70 °C) post-cure for 16 hr.
12.1 mg	176 °F (80 °C) post-cure for 16 hr.

SHEAR STRENGTH BY PUNCH TOOL

When tested in accordance with ASTM D732, the punch-type shear strength of Belzona 7111 samples cured at 72 °F (22 °C) for 7 days will typically be:

6,590 psi (45.4 MPa)

TENSILE PROPERTIES

When tested in accordance with ASTM D638, the tensile strength of samples of Belzona 7111 cured at 72 °F (22 °C) will typically be:

6,410 psi (44.2 MPa)

APPROVALS

American Bureau of Shipping (ABS) Type Approval
Belzona 7111 holds "Product Type Approval" by ABS under certificate number 24-0168183-PDA.

Bureau Veritas (BV)
Belzona 7111 holds "Type Approval for Resin Chocks" by Bureau Veritas under certificate number 69999/A0 BV.

Det Norske Veritas (DNV)
Belzona 7111 holds "Type Approval" by DNV under certificate number TAM0000028.

Lloyd's Register (LR)
Belzona 7111 holds "Chocking Resin Approval" by LR under certificate number LR2149378ALP.

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 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 7111 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

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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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