

# PRODUCT SPECIFICATION SHEET

## BELZONA 1391T

FN10034



### GENERAL INFORMATION

#### Product Description:

A two component hand applied coating system designed to operate under continuous immersion at operating temperatures up to 266°F (130°C). Suitable for steaming out up to 410°F (210°C). Exhibits excellent erosion-corrosion resistance at elevated temperatures. Resistant to a broad range of aqueous solutions, hydrocarbons and process chemicals. Also used as a high strength structural adhesive for bonding or for creation of irregular load bearing shims with good electrical insulation characteristics. 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:

- Condensate extraction pumps
- Heat exchanger barrels
- Scrubber units
- Condensate return tanks
- Oil/gas and oil/water separators
- Calorifiers
- Evaporators
- Autoclaves
- Distillation units

### APPLICATION INFORMATION

#### Working Life

Will vary according to temperature. At 68°F (20°C) the usable life of mixed material is 45 minutes.

#### Cure Time

Allow the applied material to solidify for the times shown in the Belzona IFU before subjecting it to the conditions indicated.

*\* In certain instances, it may be advantageous to post cure material prior to putting into service where chemical contact is involved. Refer to Belzona for specific recommendations.*

#### Limitations of Use

**Belzona 1391T** should not be applied at temperatures below 50°F (10°C).

#### Volume Capacity

32.6 cu.in. (535 cm<sup>3</sup>)/kg.

#### Base Component

Appearance Paste  
Colour Grey  
Density 1.99 - 2.19 g/cm<sup>3</sup>

#### Solidifier Component

Appearance Liquid  
Colour Blue or Violet  
Density 0.97 - 1.01 g/cm<sup>3</sup>

#### Mixed Properties

Mixing Ratio by Weight (Base : Solidifier) 8.5 : 1  
Mixing Ratio by Volume (Base : Solidifier) 4 : 1  
Mixed Form Liquid  
Sag Resistance nil at 30 mil (0.75 mm)  
Mixed Density 1.79 - 1.95 g/cm<sup>3</sup>  
VOC content (ASTM D2369 / EPA ref. 24) 0.70% / 13.08 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.*

# PRODUCT SPECIFICATION SHEET

## BELZONA 1391T

FN10034



### ABRASION

#### Taber

Dry sliding abrasion resistance, when determined in accordance with ASTM D4060 using CS17 wheels, will typically result in:

31 mm<sup>3</sup> loss per 1000 cycles                      194°F (90°C) cure

Wet sliding abrasion resistance, when determined in accordance with ASTM D4060 using H10 wheels, will typically result in:

320 mm<sup>3</sup> loss per 1000 cycles                      68°F (20°C) cure

### ADHESION

#### Tensile Shear

The tensile shear adhesion to grit blasted steel, when tested in accordance with ASTM D1002, is typically:

3,200 psi (22.06 MPa)	<b>Cure temperature</b>
2,800 psi (19.30 MPa)	68°F (20°C)
	212°F (100°C)

2300 psi (15.86 MPa)	<b>Cure/test temperature</b>
	212°F (100°C)

#### Pull Off Adhesion

When tested in accordance with ASTM D 4541/ISO 4624, the pull off strength from grit blasted steel will be typically:

3770 psi (25.99 MPa)	<b>Cure temperature</b>
4260 psi (29.51 MPa)	68°F (20°C)
	212°F (100°C)

### CHEMICAL ANALYSIS

The mixed **Belzona 1391T** 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	94
Chloride	482
Bromide	ND (<1)
Sulphur	161
Nitrite	ND (<7)
Nitrate	ND (<7)
Zinc	9.5
Antimony, Arsenic, Bismuth, Cadmium, Lead, Tin, Silver, Mercury, Gallium and Indium	ND (<3.0)

ND : Not Detected

### CHEMICAL RESISTANCE

Once fully cured, the material will demonstrate excellent resistance to a wide range of chemicals.

\* For a more detailed description of chemical resistance properties, determined in accordance with ISO 2812-1, please refer to relevant Chemical Resistance chart.

### COMPRESSIVE PROPERTIES

The compressive strength, when determined in accordance with ASTM D695, will typically be:

11,000 psi (75.84 MPa)	68°F (20°C)
15,000 psi (103.42 MPa)	212°F (100°C)

### CORROSION PROTECTION

#### Cathodic Disbondment

When tested in accordance with ASTM G42 the disbondment diameter is typically: 0.13 in.(3.3mm) at 194°F (90°C).

### ELECTRICAL PROPERTIES

When tested in accordance with ASTM D149, method A, with voltage rise of 2kV/s, typical value will be:

Dielectric strength	25.0 kV/mm
---------------------	------------

### ELONGATION & TENSILE PROPERTIES

When determined in accordance with ASTM D638, typical values will be:

	Cure temperature
<b>Tensile Strength</b>	
4,487 psi (30.94 MPa)	68°F (20°C)
<b>Elongation</b>	
0.61%	68°F (20°C)
<b>Young's Modulus</b>	
8.94x10 <sup>5</sup> psi (6,164 MPa)	68°F (20°C)

### EXPLOSIVE DECOMPRESSION

When tested to NACE TM 0185, using a seawater/hydrocarbon test fluid, the coating will exhibit no breakdown after a 21 day immersion period at 248°F (120°C) and 70 bar pressure followed by decompression over 15 minutes.

# PRODUCT SPECIFICATION SHEET

## BELZONA 1391T

FN10034



### FLEXURAL PROPERTIES

The flexural strength, when determined in accordance with ASTM D790, will typically be:

5,700 psi (39.3 MPa)	<b>Cure temperature</b> 68°F (20°C)
7,100 psi (48.95 MPa)	212°F (100°C)

### FOOD CONTACT

**Direct Food Contact (FDA)**  
Meets extraction requirements as set out in 21 CFR 175.300 (paragraph c) for a broad range of food types in Conditions of Use A, B, C, and D (paragraph d).  
Please contact Belzona for more comprehensive data.

**Incidental Food Contact (USDA)**  
USDA compliant as an Incidental food contact surface.

### HARDNESS

**Shore D**  
When determined in accordance with ASTM D2240, typical values will be:

80	<b>Cure temperature</b> 68°F (20°C)
86	212°F (100°C)

79	<b>Cure/test temperature</b> 212°F (100°C)
----	---

**Barcol Hardness**  
The Barcol hardness, when determined in accordance with ASTM D2583, will typically be:

	Ambient cure (68°F/20°C)	Post cure (212°F/100°C)
<b>Barcol 934-1</b>	12	30
<b>Barcol 935</b>	85	93

**Koenig Pendulum**  
When tested to ISO 1522 the Koenig damping time of the coating will typically be:

166 seconds	68°F (20°C)
-------------	-------------

### HEAT RESISTANCE

**Heat Distortion Temperature (HDT)**  
Tested to ASTM D648 (264 psi fibre stress), typical values obtained will be:

127°F (53°C)	<b>Cure temperature</b> 68°F (20°C)
284°F (140°C)	212°F (100°C)

**Atlas Cell Cold Wall Immersion Test**  
When tested in accordance with NACE TM 0174 procedure A, the coating will exhibit no blistering or rusting (ASTM D714 rating 10; ASTM D610 rating 10) after 6 months immersion in water at 266°F (130°C).

**Immersion Resistance**  
Suitable for service at temperatures up to 266°F (130°C) but refer to chemical resistance data for chemical contact limitations.

**Steam-out Resistance**  
Once fully cured the coating will exhibit no blistering, cracking or delamination after 96 hours exposure to pressurized steam at 410°F (210°C).

**Dry Heat Resistance**  
The indicated degradation temperature in air based on Differential Scanning Calorimetry (DSC) operated in accordance with ISO11357 is typically 482°F (250°C).

### IMPACT RESISTANCE

**Impact Strength**  
The impact strength (reverse notched) when tested to ASTM D256 is typically:

0.46 ft.lbs./in (25 J/m)	<b>Cure temperature</b> 68°F (20°C)
0.56 ft.lbs./in (30 J/m)	212°F (100°C)

### THERMAL PROPERTIES

**Thermal Conductivity**  
When tested in accordance with ASTM E1461-13 at a temperature of 100°C (212°F), the thermal conductivity will typically be 0.478 W/m·K.

**Low Temperature Thermal Shock**  
Coated steel panels will exhibit no blistering, cracking or delamination after multiple cycles of rapid cooling from 212°F to -76°F (100°C to -60°C).

**Thermal Cycling**  
When tested in accordance with section 9 of NACE TM0304, the coating passed after 252 cycles between +140°F and -22°F (+60°C and -30°C).

# PRODUCT SPECIFICATION SHEET

## BELZONA 1391T

FN10034



### THICK FILM CRACKING

#### Thick Film Cracking

When tested in accordance with Section 12 of NACE TM0104, the coating at three times recommended thickness, exhibited no cracking after 12 weeks immersion in seawater at 104°F (40°C).

### SHELF LIFE

Separate base and solidifier components shall have a shelf life of 3 years from date of manufacture when stored in their original unopened containers between 41°F (5°C) and 86°F (30°C).

### 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 1391T** 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.

### MANUFACTURER / SUPPLIER

Belzona Limited,  
Claro Road, Harrogate,  
HG1 4DS, UK

Belzona Inc.  
14300 NW 60<sup>th</sup> Ave,  
Miami Lakes, FL, 33014, USA

### HEALTH AND SAFETY

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

### 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.

Nothing in the foregoing statement shall exclude or limit any liability of Belzona to the extent such liability cannot by law be excluded or limited.

Copyright © 2022 Belzona International Limited. Belzona® is a registered trademark.

*Belzona products are  
manufactured under an  
ISO 9001 Registered  
Quality Management System*

