



ISO/ASME Compliant Composite Repair System

Belzona SuperWrap II is a composite repair solution designed to restore strength to weakened or holed metallic substrates. Developed specifically for safety critical and pressurised systems, it is suitable for vessels and pipes, including bends, tees and other complex geometries.

A unique combination of a 100% solids resin, carbon and glass fibre reinforcement sheet, and a compression film ensures a quick and simple application that can remain maintenance-free for up to 20 years.

Belzona SuperWrap II is available in a choice of three resin grades designed for applications in cooler or hotter climates, as well as for high temperature service of up to 150°C/302°F.



Belzona SuperWrap II is intended for use on various geometries of pipes, including bends, straights, tees, reducers and flanges.



The system can also be applied as a patch repair to large diameter pipes, pressure vessels and tank walls.



The system has undergone testing in accordance with ISO 24817 and ASME PCC-2, from determining the physical properties of the systems to long-term 1,000 hour immersion tests.



Numerous Belzona SuperWrap II systems have been successfully installed, with their success assured by application validation.

Key Benefits:

- **Quick return to service**

Wet-on-wet application procedure and fast cure ensure minimum downtime.

- **Extensive damage repaired**

Through-wall defects can be repaired by bonding a plate under the wrap with a Belzona adhesive.

- **Compliant engineered repair**

Belzona SuperWrap II designs and applications are carried out in accordance with ISO 24817 and ASME PCC-2.

- **Strong and durable solution**

High Young's modulus and the ultra-high adhesion to the substrate ensure long-term integrity of the repair and maximise performance, especially on through-wall defects.

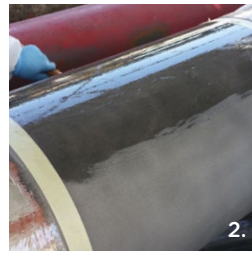
- **Training and support**

Full validated training is provided for Installers, Supervisors and Designers of the system.

Application



Preparation
Repair any thin- or through-wall defects prior to application.



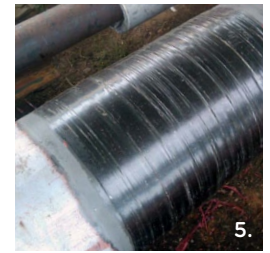
Wetting Out
The substrate and the reinforcement sheet are wetted out with resin.



Wrapping
Wrap or patch is applied according to design.



Consolidating
Release film is used to compress and tighten the wrap.




Inspection
Once cured, release film is removed and the wrap is inspected.

Grades

 **Winter Grade**

Designed for colder climates, Belzona 1981 can be applied between 5°C - 20°C/41°F - 68°F. Once cured it resists temperatures up to 60°C/140°F.

 **Tropical Grade**

For applications in higher ambient temperatures, 20°C - 40°C/68°F - 104°F, Belzona 1982 resin was designed. Once cured it resists temperatures up to 80°C/176°F.

 **High Temperature Grade**

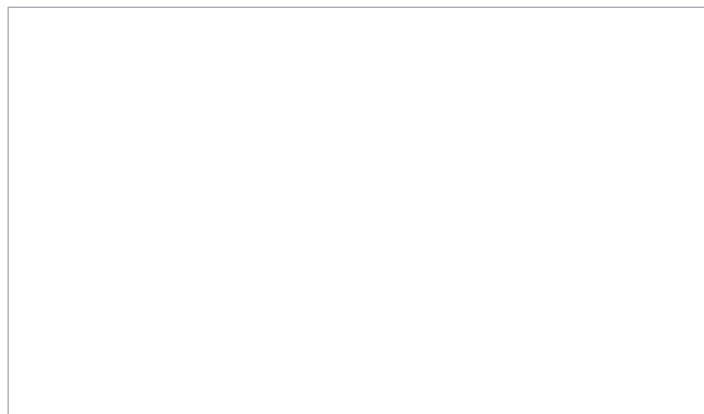
For assets operating in high temperature service, up to 150°C/302°F, Belzona 1983 resin was formulated. It can be applied at 5°C - 40°C/41°F - 104°F.

Key Technical Data

| Symbol | Property | Belzona 1981 | Belzona 1982 | Belzona 1983 | Unit |
|--------------------|--|---------------------------|---------------------------|---------------------------|------------------|
| E _c | 0° Tensile Modulus | 38800 | 38600 | 36900 | MPa |
| E _a | 90° Tensile Modulus | 18300 | 15500 | 15900 | MPa |
| | 0° Tensile Strength | 524 | 505 | 461 | MPa |
| | 90° Tensile Strength | 126 | 121 | 109 | MPa |
| ν | 0° Poisson's Ratio | 0.26 | 0.26 | 0.25 | |
| ν | 90° Poisson's Ratio | 0.27 | 0.13 | 0.14 | |
| ε _{short} | 0° Strain to Failure | 1.37 | 1.34 | 1.28 | % |
| ε _{short} | 90° Strain to Failure | 0.81 | 1.24 | 0.72 | % |
| G | Shear Modulus | 7830 | 7630 | 7200 | MPa |
| T _g | Resin Glass Transition Temperature | 90/194 | 115/239 | 188/370 | °C/°F |
| | Shore D Hardness | 90 | 91 | 90 | |
| | Lap Shear Adhesion | 15.5 | 12.3 | 7.45 | MPa |
| | Lap Shear Adhesion (1000 hour immersion) | 15.5 (40°C immersion) | 19.0 (40°C immersion) | 10.3 (150°C immersion) | MPa |
| Y _{LCL} | Energy Release Rate | 68.57 | 76.53 | 59.86 | J/m ² |
| | Impact Performance ISO24817 Annex F/ ASME PCC2 4.1 Appendix VI | Compliant | Compliant | Compliant | |
| ε _{lt} | Lower Confidence long term strain Performance Data (1000 hour) | Compliant (ISO: 0.036075) | Compliant (ISO: 0.036075) | Compliant (ISO: 0.001543) | mm/mm |
| S _{lt} | ISO24817 Annex E/ASME PCC2 4.1 Appendix V | Compliant (ASME: 1397.70) | Compliant (ASME: 1392.50) | Compliant (ASME: 5436) | PSI |
| | ISO24817 Annex C/ASME PCC2 4.1 Appendix III | Compliant | Compliant | Compliant | |

*0° = hoop direction, 90° = axial direction

For more information, please contact your local Belzona representative:



QUALITY PRODUCTS - TECHNICAL SUPPORT

The Belzona product range is manufactured through stringent quality and environmental control guidelines complying with the internationally recognised requirements of ISO 9001:2008 and ISO 14001:2004.

Belzona has a global distribution network of over 140 Distributors operating in 120 countries. Local support is provided by a trained Technical Consultant who will diagnose the problem, recommend the solution and provide 24 hour on-site application supervision and advice.



Belzona products are manufactured under an ISO 9000 Registered Quality Management System