EST. 1952

HVAC SYSTEMS

Belzona Protective Coatings and Engineering Composites

BELZONA®

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Belzona Solutions for HVAC Systems

The information in this brochure is accurate as of the time of printing. For the most up-to-date details on Belzona products and services, please contact your local Belzona representative.

Who We Are

Belzona provides the answer to a variety of industrial problems, complicated or simple. We specialize in the development of epoxy-based industrial coatings and repair composites for equipment and structures.

Mission Statement

Polymeric solutions for a sustainable future.

Company Values

Integrity

We operate from a place of integrity and adopt a “right-first-time” culture, holding ourselves accountable in everything we do.

Investment

We are committed to investing across all business areas - Corporate, Distributors, Consultants, Customers, and Contractors, providing the best service and support for our network.

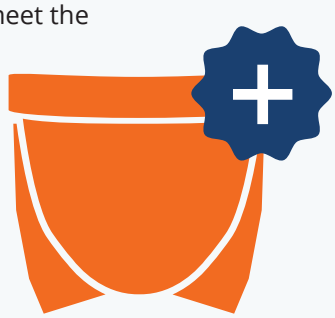
Innovation

We are committed to being a technology leader striving for continual improvement and constantly adapting to the changing industrial needs.

Product Plus

Belzona is more than just a product - via Belzona Head Offices and Global Distributor network, Belzona offers value-added services to meet the diverse needs of our industrial market.

Contact your Belzona Distributor to learn more about Product Plus services.



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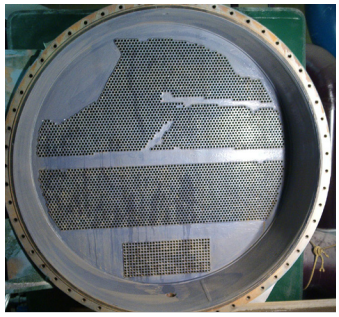
Novel Solutions to Age-Old Problems

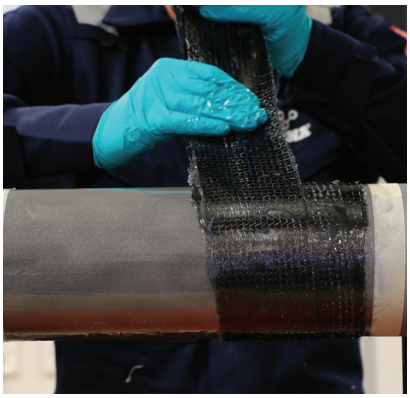
As a result of over 70 years of continuous development, Belzona provides a complete range of innovative, proven repair and protection systems for common problems affecting HVAC equipment. Our polymeric repair composites and protective coatings have stood the test of time by providing high performance solutions which are proven to last, helping clients to:

- Reduce downtime
- Extend equipment and asset life
- Reduce capital expenditure
- Improve efficiency and safety
- Simplify maintenance procedures
- Lower maintenance costs



Our unique solutions are engineered to withstand the most aggressive environments and operating conditions, such as erosion, corrosion, chemical attack and mechanical damage. We take pride in the quality of our materials as well as the comprehensive training and field support we provide to ensure the highest possible application standards.

Global Application Standards



Prequalification

Belzona materials are subject to stringent independent and in-house testing, documented in the product specification sheets and chemical resistance charts. Testing is performed in our ISO 9001 audited laboratory to recognised standards, including ASTM, ISO and NACE, as well as by independant organisations. Belzona products are approved by classification societies and companies from all around the world, including Lloyds Register, DNV GL, ABS, CCS, RS, KR, WRAS, Bureau Veritas, NSF and Nato, among others.

Specification

Optimum materials and application procedures are selected to meet the specific design and operating conditions of the asset. Dedicated Belzona trained specialists coupled with round the clock head office technical support allow for the correct material and application procedure to be specified. We also maintain a comprehensive database accessible by the Global Belzona Distributor network, which facilitates sharing of information and experience, improving specification and application standards.

Application

Application standards, including surface preparation, are integral to the success and longevity of the repair solution. Belzona recognises the need to set and monitor global standards for the application of our materials. Applications are carried out by experienced and trained personnel. Belzona runs training programmes with theoretical and practical courses, including validated training. Combined with method statements, quality control procedures and daily inspection reports, we strive to ensure application standards are maintained around the world.

Inspection

Inspection can be carried out by certified inspectors (e.g. NACE) prior to, during and upon completion of the application to ensure Belzona systems are applied in accordance with our standards and the client's requirements.

Upon nearing the end of the system's expected service life, the asset should be inspected again and appropriate action recommended, which may involve minor repair work or no action, as the Belzona systems tend to outlast projected service life.

Belzona solutions for HVAC

PROBLEMS IN HVAC SYSTEMS

Heating, Ventilation and Air Conditioning (HVAC) is essential in many industrial situations and is vital for maintaining a satisfactory working environment in large commercial facilities, sporting and entertainment stadia, theatres, hospitals and other public locations.

Corrosion is usually a major battle for building owners and managers to maintain the integrity of a HVAC system. If the issues are left untreated, there is a high probability of environmental and safety hazards, incidents and high replacement costs. Corrosion damage to components of the HVAC units can impact the overall efficiency, cost and longevity of the HVAC system.

BELZONA POLYMERIC SOLUTIONS

As a vital part of any large building, heating and air conditioning equipment needs to be regularly maintained to ensure it is able to operate 24/7. In Belzona, we recognise the need for a fully operational HVAC system and offer an array of maintenance solutions to repair and combat the typical problems related to HVAC systems.

Belzona paste grade composites rebuild the surfaces damaged by corrosion, erosion, chemical attack or wear, while the coating grade materials provide a protective layer against future degradation. These polymeric materials stop corrosion from reoccurring, ensuring a durable repair and long-term protection. With a cold and simple application, Belzona solutions allow for a rapid return to service, reducing downtime to a minimum and avoiding costly replacement.

Why Belzona?

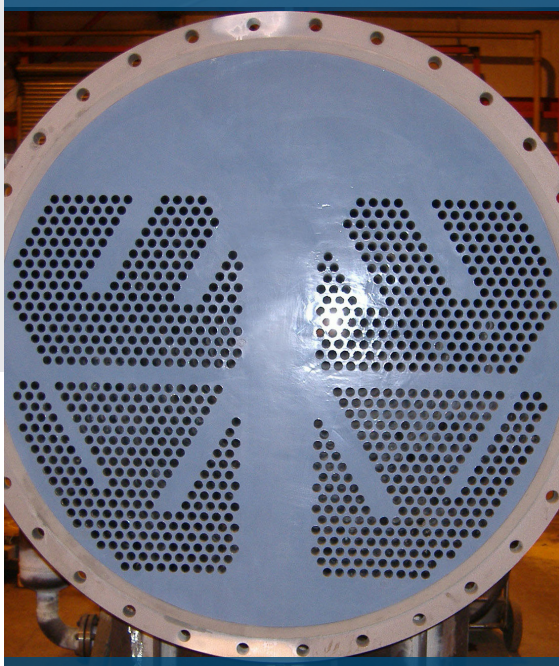
Belzona coatings and repair systems are used throughout the world to ensure that HVAC systems continue to run with minimal disruption. Belzona's composites combine easy and safe application with outstanding mechanical properties. Our versatile product range provides varied working times, cure times, temperature ranges and degrees of required surface preparation. Belzona's polymeric technology offers combination of application and in-service performance benefits rarely found in alternative solutions:

- **Cold applied - no hot work**
- **Solvent free - safe application even in confined spaces**
- **Simple application procedure - no specialist tools required**
- **Excellent adhesion to metals and other substrates**

Our range of solutions for HVAC equipment can solve many common maintenance problems including chiller corrosion, leaks in pipework and ductwork, fan erosion-corrosion, damaged thermal insulation, and poor weatherproofing and waterproofing of roof locations and service voids. The key areas of application of Belzona within HVAC are:

- Corrosion Protection of Internal Surfaces
- Rebuilding and Resurfacing of Metallic Surfaces
- Repair of Mechanical Elements such as Shafts
- Protection of Insulation and External Surfaces
- Sealing of Joints and Seams
- Erosion Protection of Fan Blades

Repair and protection of condenser water systems



Solutions for chilled water systems

Protection against air and water ingress into ductwork

Repair and Protection of Condenser Water Systems

Corrosion in Cooling Towers

In areas with a hot climate, large office buildings, hospitals, and schools typically use one or more cooling towers as part of their air conditioning systems. Unlike the large concrete units at power stations, these smaller cooling towers are commonly constructed from galvanized steel and over time suffer from corrosion.

The combination of air, water, chemicals and heat in cooling towers creates a severe corrosive environment. It is common to find perforations and holes and severe metal loss on units in service. In addition, cooling tower fan blades usually suffer from erosion of the leading edge, as well as cracks and flaking on the trailing edge, reducing the overall efficiency of the system.

Corrosion and Chemical Attack

Chemical treated water accelerates consumption of zinc galvanizing leading to premature corrosion.

Erosion by Impingement

Fan blade leading edges are frequently damaged by impingement from water droplets, causing erosion.

Mechanical Damage

Poor maintenance such as lack of bearing lubrication, loose keyways in hubs, couplings and pulleys.

Aging of the Unit and Failure of Original Coatings

Poorly specified paint systems fail to protect in warm, humid and immersed environments, leading to corrosion and consequent sludge build up which are ideal conditions for legionella bacteria.

Belzona Solutions

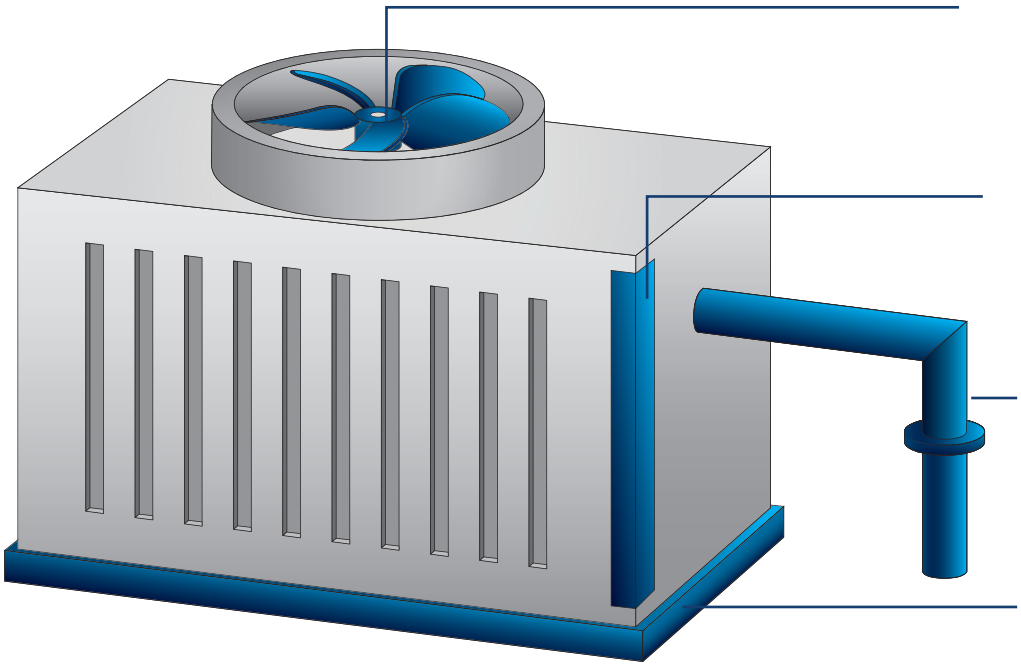
Cooling towers are often a neglected part of the system and when located on the roof, they can be difficult to maintain, repair or replace.

Belzona's materials can deal with numerous maintenance problems in cooling towers including corrosion of internal surfaces, erosion of fan blades, worn fan shafts and leaking pipework, extending maintenance-free periods.

Belzona's polymeric corrosion resistant coatings and cold-applied metal repair composites are engineered for the harsh conditions inside cooling tower systems, providing durable protection against corrosion and chemical attack, as well as erosion and wear. Pitting corrosion and metal loss can be recovered without the need for welding, avoiding expensive replacement costs. Our solutions can be used to repair damaged units, or applied to new equipment to significantly extend service life.

Application Areas

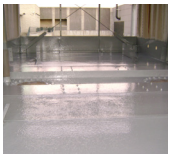
Corrosion and chemical protection of internal surfaces	**Belzona 5800 Series**
Sealing of joints (internal and external)	**Belzona 3100 Series and Belzona 2000 Series**
Plate bonding on cooling tower structure	**Belzona 1100 Series and Belzona 1200 Series**
Pipe leak sealing	**Belzona 1100 Series and Belzona 1200 Series**
Repair and protection of fan blades	**Belzona 1300 Series**
Fan shaft repair (using forming techniques)	**Belzona 1100 Series and Belzona 1200 Series**



Repair and protection of fan blades

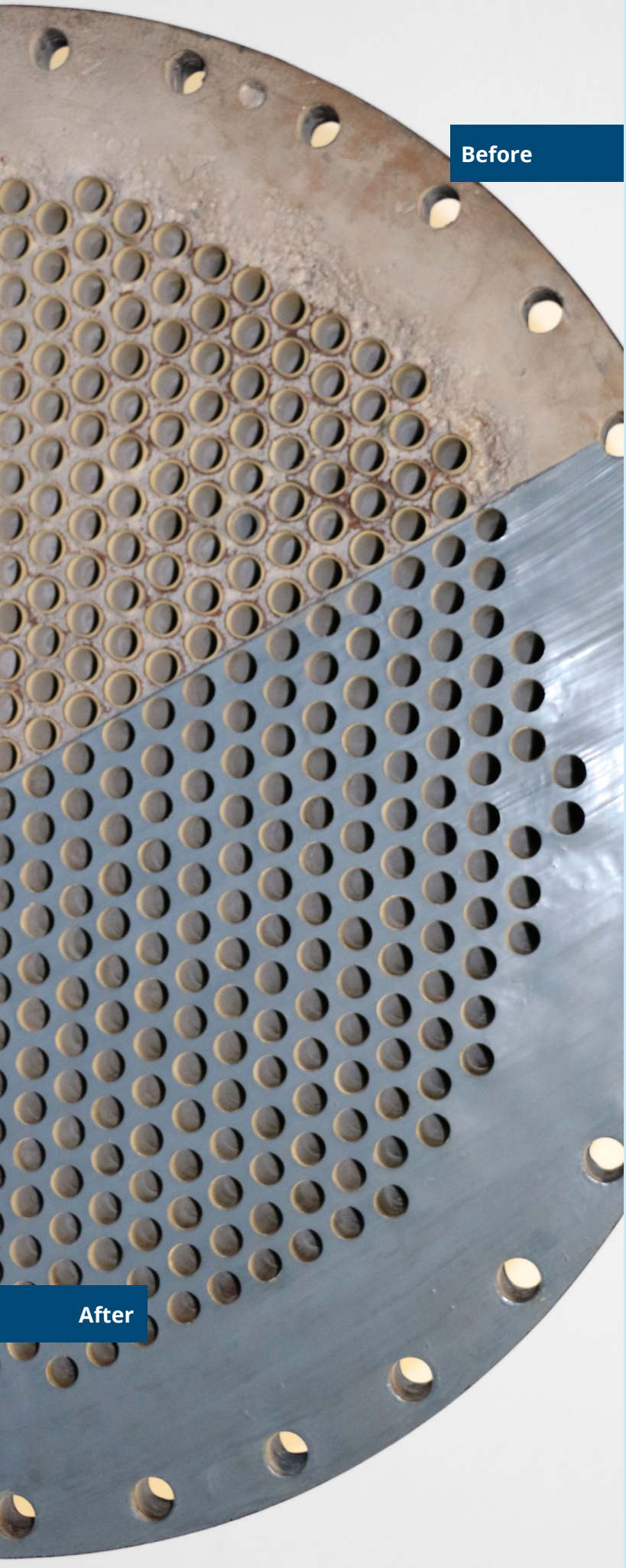
Sealing of cooling towers joints and seams

Sealing of pipe leaks



Corrosion protection on cooling tower basins and sidewalls

**For further information and advice please contact your local Belzona representative.*



Solutions for Chilled Water Systems

Chiller Deterioration

Shell and tube heat exchangers, also referred to as a chillers, are a vital part of any heating, ventilation and air conditioning system. Failure to quickly protect these units allows galvanic corrosion to take place, resulting in wastage and metal loss on the tube sheet around the tube ends.

Left untreated, the loss of metal can cause leakage and cross contamination of the hot and cold phase fluids. Corrosion is not restricted to the tube sheet, the water box and end covers can also be affected. In particular, corrosion in division bars and seal faces can lead to leakage and loss of efficiency, as well as the inability to maintain the desired working environment in buildings.

- **Galvanic Corrosion**
- **Crevice Corrosion**
- **Erosion**
- **Chemical Attack**

Belzona Solutions

The affected section is rebuilt using Belzona's two-component repair composites. The paste grade material rebuilds the substrate to its original profile, while the coating grade system provides a layer of durable protection. This cold-applied repair process bypasses the need for hot work that may leave the substrate susceptible to further damage.

Belzona polymeric technology isolates dissimilar metals, preventing galvanic corrosion. The tough repair and coating system also protects the chiller against the effects of erosion and, as a result, increases asset life and efficiency while avoiding replacement. Belzona materials are easy and quick to apply by hand, reducing downtime and hazards during application.

The Belzona solution not only restores the original tube sheet profile, but also creates a smooth tube sheet face flush with the tube ends, leading to reduced turbulence and greater efficiency. Water boxes and end covers can also be repaired and protected.

Belzona Materials

Belzona 1100 Series

Paste grade rebuilding and resurfacing materials for in-situ repair and rebuilding for damaged tube sheets prior to the application of a long-lasting protective coating.

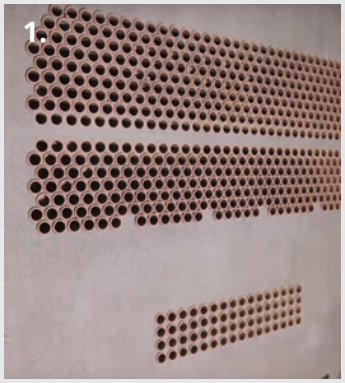
Belzona 1200 Series

Fast curing emergency paste grade rebuilding and resurfacing materials for the rapid repair of metallic parts.

Belzona 1300 Series

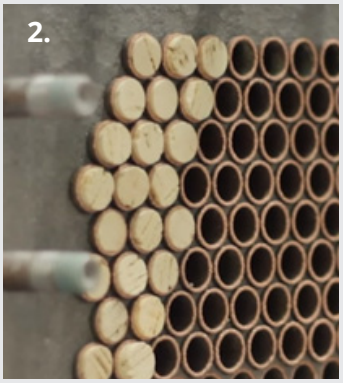
Ceramic filled and high molecular weight polymer coatings and rebuilding materials to stop galvanic corrosion and significantly slow down erosion, reducing expenses associated with repairs or replacement.

Repair of Erosion-Corrosion Damage in Tube Sheets



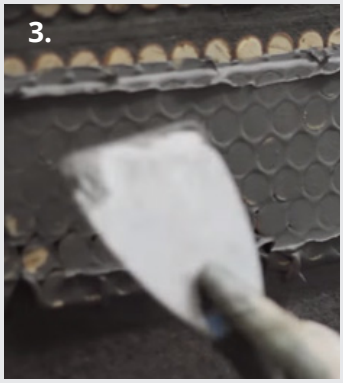
Surface Preparation

The corroded surface is prepared by grit-blasting and washed with Belzona 9111 to remove all residual blasting debris.



Insertion of Corks

The tubes are blocked off with tapered corks. The corks are levelled using the most protruding tube as a guide.



Surface Rebuilding

The Belzona material is applied to all eroded areas using an applicator to restore the original profile.

Completed Application

The Belzona coating provides complete protection against the effects of erosion-corrosion and outstanding resistance to chemicals.

Protection Against Air and Water Ingress into Ductwork

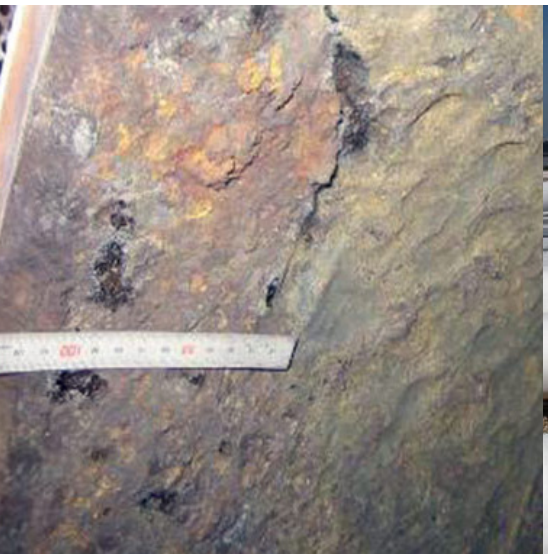
Air System Maintenance Challenges

From internal corrosion, accelerated by water condensation, high temperatures, aggressive cleaning chemicals and microbiological growth, to the failure of joints and seams, maintenance of air handlers and ductwork can prove challenging. Condensation weakens and corrodes the metal of the ducts, which can lead to air leaks and water ingress, and subsequent efficiency losses and operational failure.

Belzona recognises the challenges of air system maintenance and addresses them with the development of cold-applied polymeric repair materials and corrosion resistant coatings designed to function in these severe operating conditions.

- Corrosion of internal surfaces
- Metal loss leading to thin-wall and through-wall metal defects
- Internal microbiological growth
- Deterioration of joints and seams
- Air leaks and water ingress
- Corrosion under insulation

Belzona Solutions



Metal Loss Repair

Corrosion of surfaces such as condensate drip pans, cooling coil supports and ductwork can cause significant metal loss, leading to thin-wall and even through-wall defects. Belzona's metal repair materials offer a cold-applied alternative to replacement or unwanted hot work repairs.

Belzona 1100 Series

Multi-purpose composite repair materials for the rebuilding and resurfacing of metal surfaces, or for metal plate bonding.

Belzona 1200 Series

Fast-curing repair materials for rapid repair and rebuilding of metal substrates, even with minimal surface preparation and wet surface.

Corrosion and Weathering Protection

The coating of interior air handler parts and ductwork prevents future corrosion, avoiding premature failure and replacement. In addition, external encapsulation provides seamless protection at ductwork elbows, T-pieces and complex contours.

Belzona 5800 Series

Solvent-free internal coatings for excellent corrosion protection and engineered for the harsh environment inside the HVAC system.

Belzona 3000 Series

Liquid-applied flexible membranes for insulation encapsulation, providing a barrier against corrosion that can be cut open and resealed for periodic inspection.

Joint and Seam Sealing

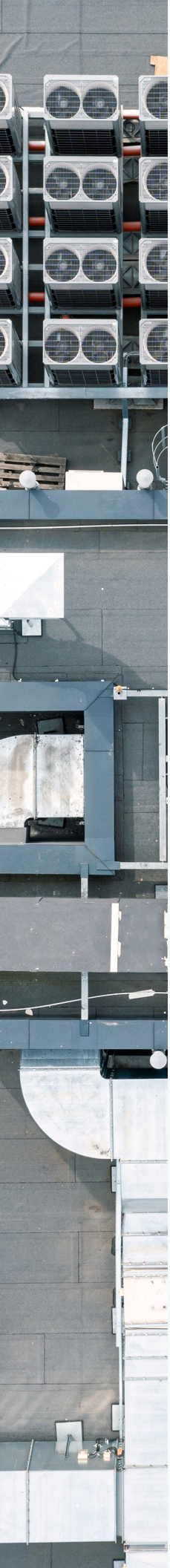
Failure of joints and seams can allow ingress of water and disruption of air flow, affecting the efficiency of the system. Belzona's flexible repair materials can restore joints and seams to give long-lasting solution. Sealing at the interface between the roof and the ductwork can also be achieved with Belzona flexible membranes.

Belzona 2000 Series

Flexible, durable elastomers used to restore deteriorated joints and seams, whilst accommodating for movement between sections.

Belzona 3000 Series

Liquid-applied flexible membranes for effective sealing of the roof-ductwork interface.



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BELZONA® Product Plus

Belzona Is a Global Manufacturer of Repair Composite Materials & Industrial Coatings.

US • UK • Canada • China • Thailand

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

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