

MACHINERY & EQUIPMENT

*Belzona Solutions for Machinery &
Equipment Brochure*

Belzona Solutions for Machinery & Equipment



A crusher base stabilized using Belzona anchoring solutions

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.

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.



Table of Contents

04

Metal Repair

For repairing, rebuilding, and bonding applications on metal assets.

08

Chocking and Shimming

For help maintaining and installing machinery and equipment.

10

Anti-Corrosion Coatings

Anti-corrosion coatings protect assets from corrosion.

12

Erosion Protection

For repairing and protecting machinery and equipment against erosion damage.

14

Abrasion Resistant Coatings

Protecting machinery and equipment from impact, abrasion, and wear.

16

High-Temperature Coatings

Coatings to protect equipment immersed in chemical solutions operating at high temperatures.

18

Chemical Resistant Coatings

Coatings that provide long-term chemical protection, even at high temperatures.

20

Rubber Repair

For the repair, casting and coating of flexible components.

22

Concrete Repair

Repair resins designed to restore damaged concrete subjected to erosion, corrosion, and abrasion.

24

Global Application Standards

Prequalification, Specification, Application, and Inspection.



Metal Repairs

For repairing, rebuilding, and bonding applications on metal assets.

Belzona's solutions restore and safeguard the integrity of machinery and equipment, providing resistance to mechanisms including corrosion, erosion, chemical attack, and impact damage. Metal substrates can leverage the versatile capabilities of this extensive range for applications such as composite pipe wraps, forming, pit filling, cold bonding, leak sealing, and extending asset lifetime.

Belzona Repairs and Protects Water Softener



Internal corrosion resulting in pin hole leaks

Plate bond and wrap repair on pipe

Five Years of Proven Reliability: Belzona Pipe Repair

Two welded areas on this pipe had experienced internal corrosion resulting in pin hole leaks. Traditional cutting and welding methods were unsuitable in this Pharmaceutical Plant due to environmental constraints and stringent safety regulations. In addition, these methods would not prevent future corrosion. The cold applied, Belzona metal repair solution was chosen as it is solvent free, reducing health and safety risks. Installed and cured using external heat, it minimized downtime and ensured long-lasting protection. As a result, the Belzona solution extended the equipment's lifespan by preventing future corrosion. This repair demonstrated its reliability and effectiveness in service for over five years, showcasing its superior performance against traditional repair methods.

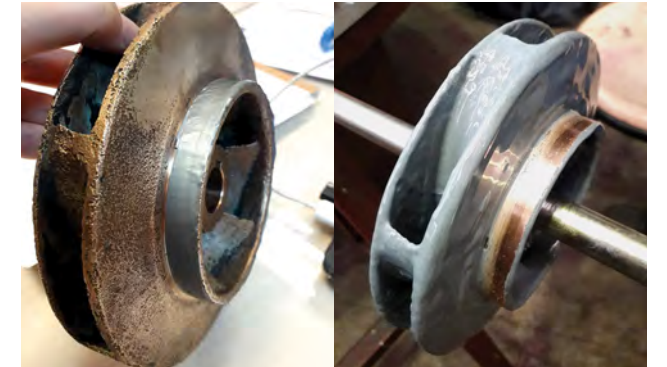
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Common Applications

Pump Maintenance



Eroded pump impeller repaired and protected



Pump impeller rebuilt and protected from erosion-corrosion

Leak Sealing



Tank base causing local flooding sealed



Live leak on a pipe sealed with Belzona

Composite Pipe Wrap



Pipe wall strength restored using compliant pipe wrap



Wrap repair on pipework

More Metal Repair Applications

Shaft Repair



Shaft rebuilt using Belzona paste-grade material

Jaw crusher's damaged shaft and keyway repaired

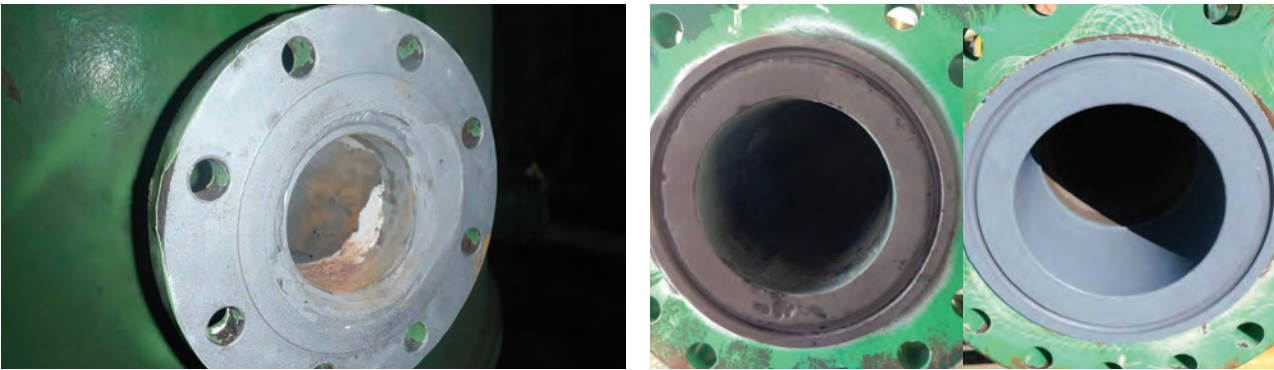
Engines and Casings



Engine block leaking coolant repaired

Damaged engine case repaired with Belzona

Flange Face Forming



Flange face after grit blasting and deep pitting

Flange faces rebuilt and restored using forming technique

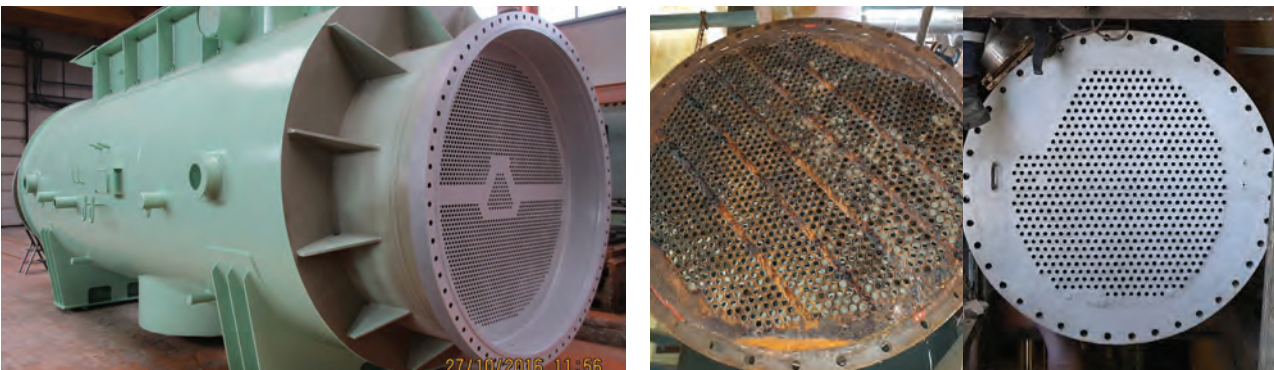
Tank Restoration



Corroded tank wall repaired

Lid repaired with plate bonding technique

Heat Exchanger Overhaul



Condenser protected from erosion-corrosion

Full tube sheet rebuilt and protected from corrosion

Pipe Repair



Composite pad installed for pipeline repair

Damaged GRP pipe repaired using Belzona's cold bonding solution

Chocking, Shimming & Bonding

Shimming, chocking, and bonding solutions help install and maintain machinery and equipment.

Belzona’s 100% solids chocking and grouting materials are ideal for creating irregularly shaped, high-strength load-bearing shims and chocks. Designed for versatility, they can be poured or injected into hard-to-reach areas, offering exceptional compressive strength. Belzona’s structural bonding solutions deliver superior mechanical strength, cleavage, shear resistance, and durability under cyclic and repeated loads—providing a safe, cost-effective alternative to welding and mechanical fasteners.

Belzona Protects Chemical Containment Area



Deterioration of the concrete due to leakage and contamination

Shimming and protecting base of support steelwork

Six Years of Durability: Perfect Condition of Concrete Containment Area Post-Repair

The concrete had suffered heavy deterioration due to leakage and contamination during maintenance operations, compromising the integrity of the structure. The repair was conducted in accordance with Belzona Know-How System Leaflet TCC-15, with special attention given to shimming and protecting the base of the support steelwork. The area was brought up to standard to meet the required regulations, and additional protection was provided for the supports. Repairs can be easily carried out if needed. During the last inspection in 2009, the containment area was found to be in perfect condition, demonstrating the durability of the solution.

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Common Applications

Resin Chocks



New boiler required chocking into place



Installed lathe required chocking for stabilization

Irregular Shims



Concrete shimming of crane base

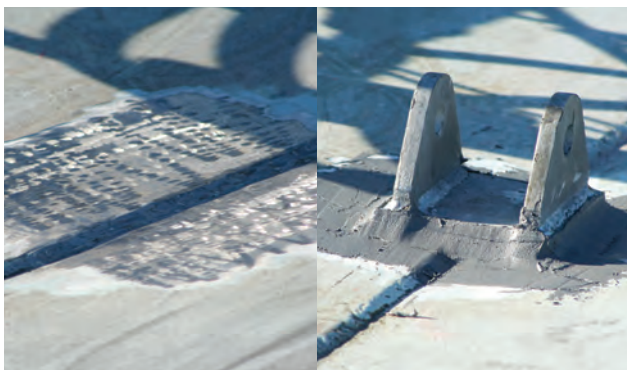


Vessel supports repaired and protected

High Strength Adhesives and Structural Bonding



Belzona 7311 bonding pipe supports on the top of a tank



Plates bonded on top of a water tower for radio dishes

Anti-Corrosion Coatings

Anti-corrosion coatings protect assets from corrosion.

Belzona's solvent-free epoxy coatings protect assets such as pipework, vessels, tanks, and pumps from corrosion. They can extend service life, restoring or even improving efficiency in corrosive environments, often under immersion at elevated temperatures. These coatings help to avoid worst-case scenarios such as spiraling maintenance costs, safety hazards, and unplanned shutdowns.

Proven to Provide Long-Term Protection in Molten Sulfur



Short working life of pumps due to high corrosion

Pumps coated to provide long-term protection

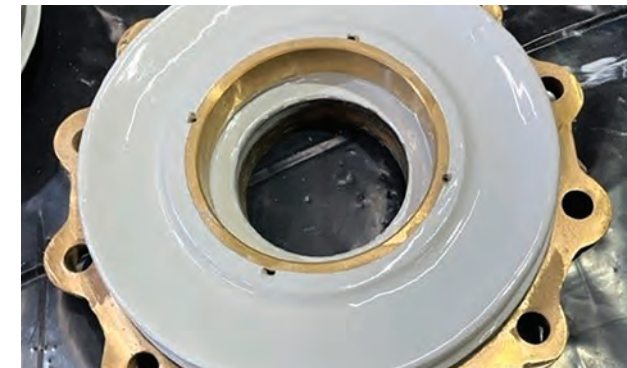
Five Years Later: Belzona 1593 Coating Shows Minimal Damage in Sulfur Pit Pumps

Since 1997, Belzona 1591 has been used to coat many pumps in a sulfur pit. Corrosion spots began to appear on the internal equipment of the sulfur pit, necessitating protection from further damage. The surface was grit blasted to achieve a cleanliness level of Sa2½ before applying two coats of Belzona 1593 to provide outstanding corrosion protection. This application followed Belzona Know-How System Leaflets VPF-2. The pump, originally coated in 2017, was revisited in 2022, and the coating showed minimal damage. The Customer opted for a full recoat, although a small repair would have sufficed. The pumps, inspected five years later, displayed minimal damage.

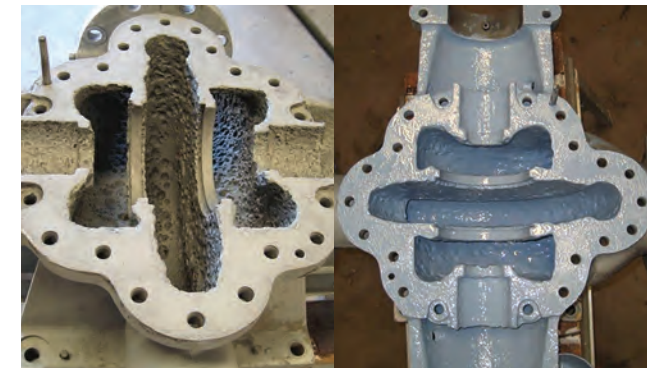
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Common Applications

Pump Improvement

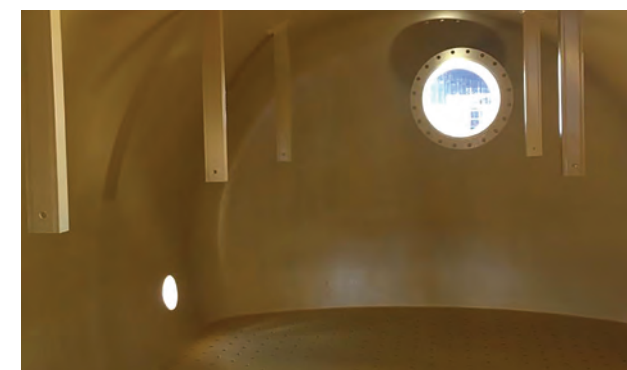


Pump rebuilt and protected



Efficiency of a water pump improved

Tank Protection



Internal protection for media filters at desalination plant

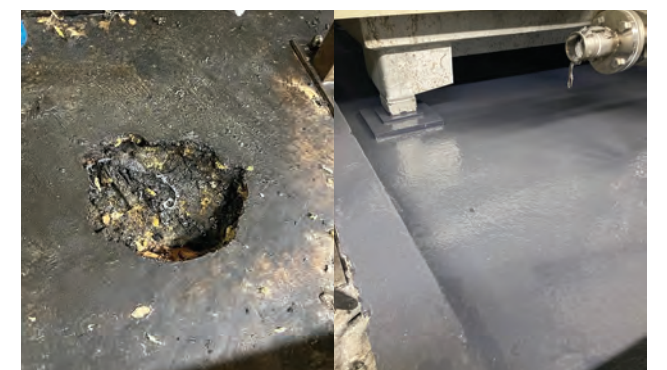


External corrosion protection on tank

Chemical Containment Areas



Sulfuric acid containment area coated and protected



Corroded concrete repaired and protected from chemical attack

Erosion Protection

For repairing and protecting machinery and equipment against erosion damage.

Left untreated, erosion damage can hinder the efficiency, integrity, and even the safety of machinery and equipment, potentially leading to disastrous consequences for facilities. Belzona's erosion-resistant repair and protection materials safeguard against these effects, with suitability for aggressive service environments such as under immersion where entrained solids may be present.

Belzona Saves Refinery \$50,000



Erosion of thickness and gasket sealing surfaces

Dollar plate repaired and coated

Significant Savings and Longevity for Heat Exchanger Repairs

Galvanic corrosion and erosion had caused a loss of thickness and compromised gasket sealing surfaces, allowing working fluid to bypass sections of the multi-pass exchanger and significantly reducing its efficiency. To address this, Belzona 1111 (Super Metal) and Belzona 1321 (Ceramic S-Metal) were applied according to Belzona Know-How System Leaflet HEX-2. Conventional repair methods involve weld buildup followed by machining new gasket surfaces, costing between \$2,500 and \$5,000 per plate. In contrast, the Belzona solution costs less than half of the conventional repair, resulting in cost savings of over \$50,000 per unit turnaround. The heat exchanger channel head has remained in excellent condition after five years in service.

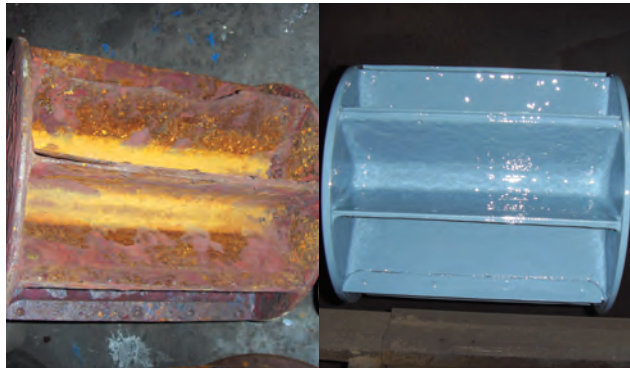
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Search for the KHIA ID: 1013*

Common Applications

Improved Efficiency



Kaplan turbine rebuilt and protected



Vacuum pump rotor repaired and protected

Valves, Pipes and Fittings



Valve repaired and protected from sea water erosion



Emergency flange repair

Leading Edge Protection



Protection of wind turbine blades



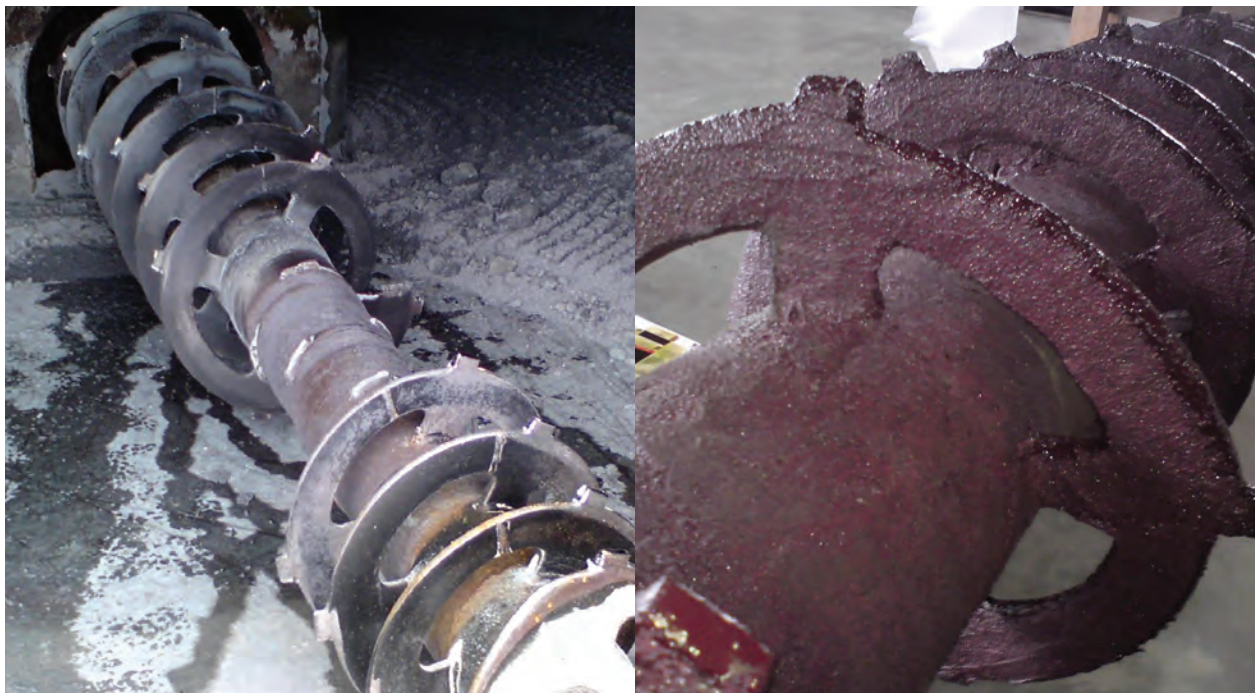
Rain erosion repaired with Belzona leading edge protection solutions

Abrasion Resistant Coatings

Protecting machinery and equipment from impact, abrasion, and wear.

Abrasion profoundly affects the performance of equipment. By mitigating its adverse impacts, Belzona's resistant linings prolong the life of the equipment and increase operational efficiency. When it comes to processes like extraction, transportation, crushing, and milling, Belzona's abrasion-resistant linings offer exceptional protection against wear and tear.

Belzona Protects Screw Auger from Abrasion



Screw auger needed protective coatings

Protected against abrasion and chemical attack

Cost-Effective Belzona Coating Protects Screw Auger: Proven Reliability After 8 Years

A coating was required to protect a screw auger from abrasion and chemical attack. After surface preparation, Belzona 1811 (Ceramic Carbide) was applied to guard against abrasive wear, and Belzona 4311 (Magma CR1) was used to protect against chemical damage. The Belzona solution was chosen due to its significant cost advantage over replacing the screw auger. Additionally, the maintenance team could perform the repair in situ, and the Belzona materials cured much faster than alternatives, allowing the screw auger to return to operation quickly. The solution has demonstrated proven reliability after eight years in service.

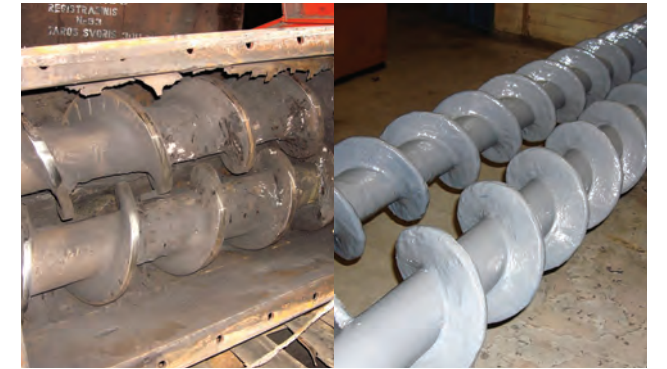
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Common Applications

Screw Conveyors



Abrasion resistant coating extends service life

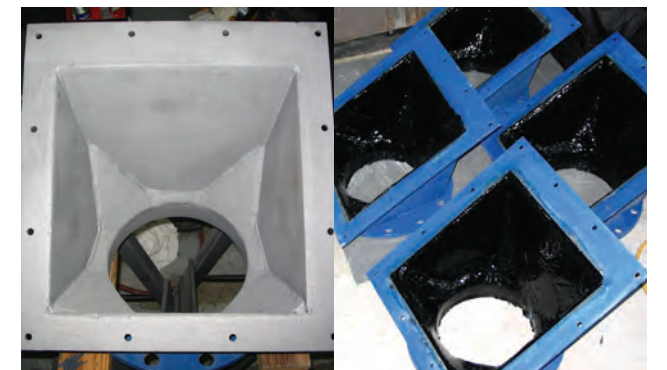


Auger screws repaired and protected from severe abrasion

Chutes and Hoppers



New chute coated for abrasion resistance



Hoppers protected for extended life

Turbo Separators



Abrasion resistant grouting repair for turbo separator



Separator inlet restored

High-Temperature Coatings

Coatings to protect equipment immersed in chemical solutions operating at high temperatures.

Belzona high-temperature coatings are two-coat systems applied to the interior of piping, pipework, tanks, vessels, containers, or process equipment subject to direct contact and immersion in chemical solutions at operating temperatures above 90°C (194°F). These high-temperature-resistant materials have been prequalified to protect machinery and equipment in a variety of industries.

Belzona Repairs and Protects Heat Exchanger



Degradation of surface due to high temperature acidic media

Heat exchangers repaired and protected

Belzona Repair Delivers Protection for Heat Exchangers—Reinspected After 3 Years

Severe corrosion and erosion had affected both ends of two heat exchangers, with surface degradation caused by high-temperature, aggressive acidic media. The repair was carried out according to Belzona Know-How System Leaflets HEX-1 and HEX-3. The Customer was in the process of obtaining quotes for new heat exchangers, but Belzona offered a lower-cost alternative with minimal delay and disruption to production. The Belzona solution has provided excellent protection, and after three years in service, the repair was reinspected and still performing exceptionally well.

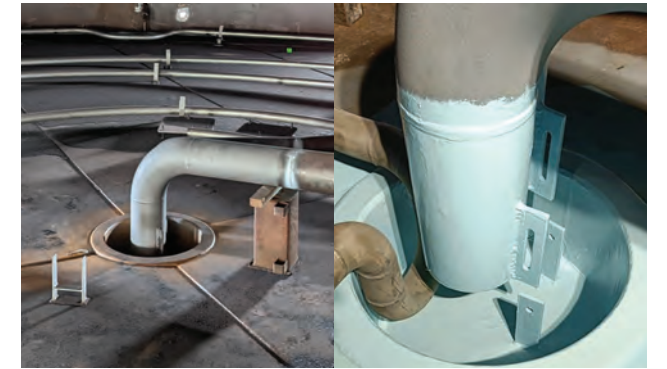
*View more information on khia.belzona.com
Search for the KHIA ID: 6061*

Common Applications

Tanks and Vessels



Internal coating for high temperature tank



Storage tank protected against high temperatures

Pipework Insulation



Insulating the thermal process of pipework to reduce heat loss



Exposed hot pipeline made safe with insulation

Pipework



High temperature corrosion protection for new water filters



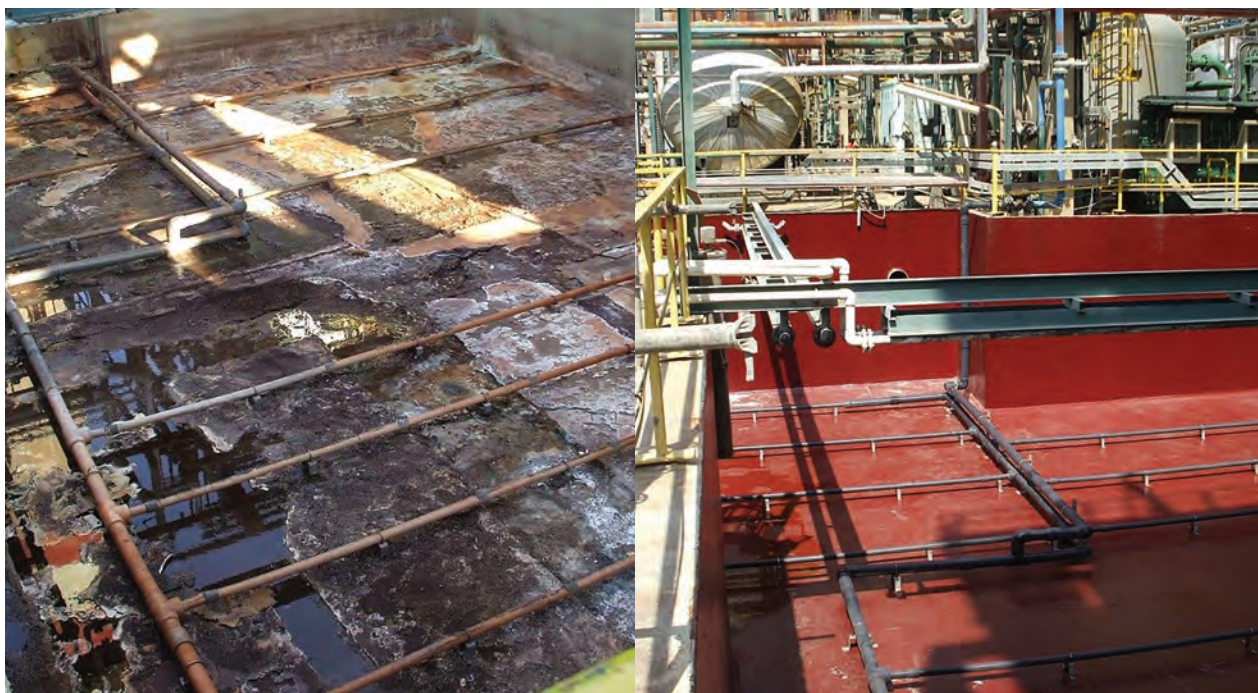
Desulfurization unit protected with coating

Chemical Resistant Coatings

Coatings that provide long-term chemical protection even at high temperatures.

High-strength Belzona epoxy coatings provide excellent chemical resistance, as well as compressive strength. Our chemical resistant coatings will provide long-term protection against a wide range of substances including acids and alkalis, even at high temperatures.

Belzona Protects Large Bund from Chemical Attack



Severe damage to the coating and concrete from chemicals

Two years after applying the protective coating

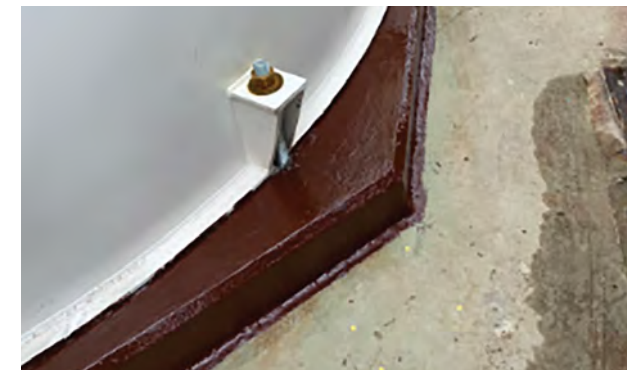
Refinery Bund Performs Excellently After Almost 2 Years

A chemical neutralization bund in a Refinery contained sulfuric acid at a 90% concentration and sodium hydroxide at a 50% concentration, with temperatures reaching up to 176°F (80°C). The application followed Belzona System Leaflet TCC-15. Initially, the concrete was cleaned with high-pressure water jetting to remove the existing coating and contaminants from the substrate. The surface was then grit blasted using metallic grit, and Belzona 4981 was applied to ensure excellent adhesion. Finally, a two-coat system of Belzona 4341 (Magma CR4) was applied to form a protective barrier. A previous coating had failed after a short time in service, so the Customer needed a long-lasting coating to prevent concrete degradation and potential spillages into the ground. Having had positive experiences with Belzona solutions for various applications, including pumps, composite patches, and composite pipe wraps, the Customer was confident in Belzona's ability to deliver an effective solution. After 1.5 years in service, the area was revisited and found to be in excellent condition.

*View more information on khia.belzona.com
Search for the KHIA ID: 7966*

Common Applications

Tanks and Vessels



Sulfuric acid tank base protected with Belzona



Scrubber vessels coated to protect from chemical attack

Containment Areas

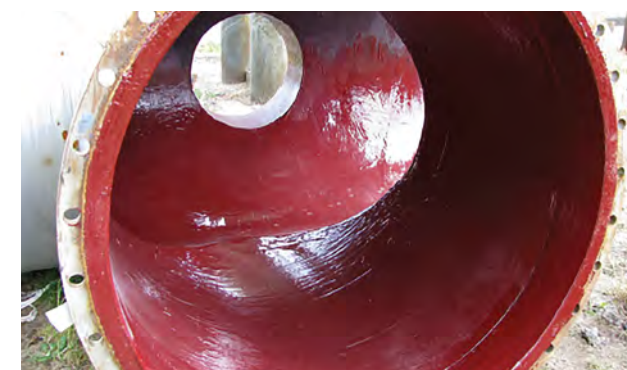


Spirit containment area repaired and protected



Concrete was rebuilt and protected from sulfuric acid damage

Pipes and Nozzles



Internal lining protected against chemical attack



Damaged acid intake nozzle rebuilt

Rubber Repair

For the repair, casting and coating of flexible components.

Belzona's rubber repair materials are specifically designed for machinery and equipment applications where high build, durability, elasticity, high abrasion and tear resistance are required. They can be used to repair a range of components including conveyor belts, floating hoses, gasket seals and rubber rollers. In addition, these solutions provide excellent cavitation and erosion resistance, making them ideal for applications in harsh industrial environments where components are exposed to aggressive wear and tear, such as pumps, impellers, and pipe linings.

Protection of Cooling Water Pump Impeller From Cavitation



Cavitation damage

Impeller coated to protect against future cavitation

Belzona Saves Nuclear Power Plant Significant Downtime

During a planned overhaul, severe cavitation was detected on one of the main cooling pumps at a Nuclear Power Plant. This damage, if left unaddressed, could lead to operational inefficiencies and potential shutdowns. The pump's impeller was grit blasted and the cavitation damage was rebuilt to its original profile using Belzona 1111 (Super Metal), a durable metal repair composite. The entire surface of the impeller was then coated with Belzona 1341 (Supermetalgilde), an efficiency enhancement protective coating. Specific cavitation impact zones received an additional layer of Belzona 2141 (ACR-Fluid Elastomer) which is designed to withstand the forces of cavitation.

*View more information on khia.belzona.com
Search for the KHIA ID: 9060*

Common Applications

Conveyor Belts



Repaired 4km long conveyor belt back in operation



Damaged conveyor belt at a paper mill repaired

Floating Hoses

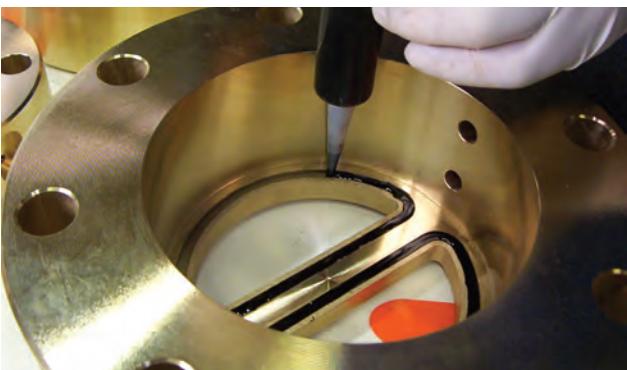


Rubber covers on fuel hoses repaired



Repaired floating hose damaged by collision with a ship's propeller

Valve Seals



Valves sealed to prevent water re-entering the pump



Butterfly valve rubber repaired

Concrete Repair

Repair resins designed to restore damaged concrete from erosion, corrosion, and abrasion.

Belzona offers polymeric concrete repair materials which repair existing damage and protect the substrate against future attacks, providing a long-term solution. Belzona's concrete repair materials adhere to the existing concrete and cure in hours, achieving full mechanical hardness soon after. Their high compressive strength, chemical resistance, abrasion resistance, and simple application are ideal for small patches or large areas.

Belzona Restores 50 Year Old Plinths at Fertilizer Plant



Damaged concrete plinths

Concrete rebuilt and restored for new machinery

Belzona Restores Aged Concrete Plinths, Preventing Costly Delays

A 50-year-old fertilizer plant in Sweden needed to install new machinery, but its existing concrete plinths were severely corroded and damaged. Traditional concrete repairs were not an option due to long curing times that would delay the project. Instead, Belzona provided a fast and durable solution using its high-performance epoxy repair composites. The application involved surface preparation, rebuilding the damaged areas, and applying a protective coating to ensure long-term performance. Belzona 4111 (Magma-Quartz) was used for structural rebuilding, while Belzona 4154 (Bulkfill Resin) provided volume filling and reinforcement. This repair method allowed for a quick return to service, preventing costly downtime. Nearly a decade later, the application remains intact, demonstrating Belzona's long-lasting durability. The project highlights the effectiveness of epoxy solutions in industrial environments where speed and reliability are crucial. Belzona's repair materials not only restored the plinths but also extended their lifespan, ensuring continued operational efficiency.

*View more information on khia.belzona.com
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Common Applications

Plinths and Footings



Metallic footing of a pulper and concrete restored



Damaged concrete footing repaired and rebuilt

Concrete Bases



Concrete cell bases rebuilt from chemical attack

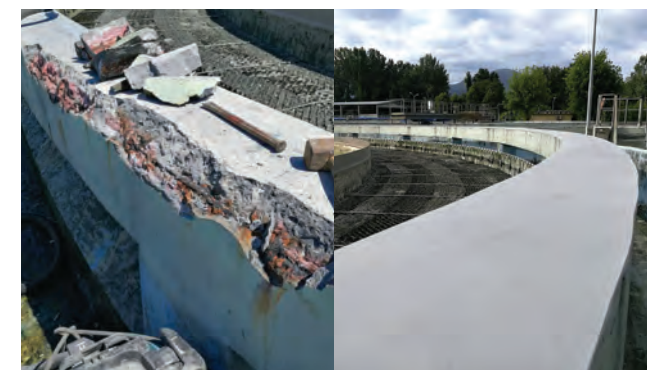


Tank base repaired and restored from corrosion

Clarifier



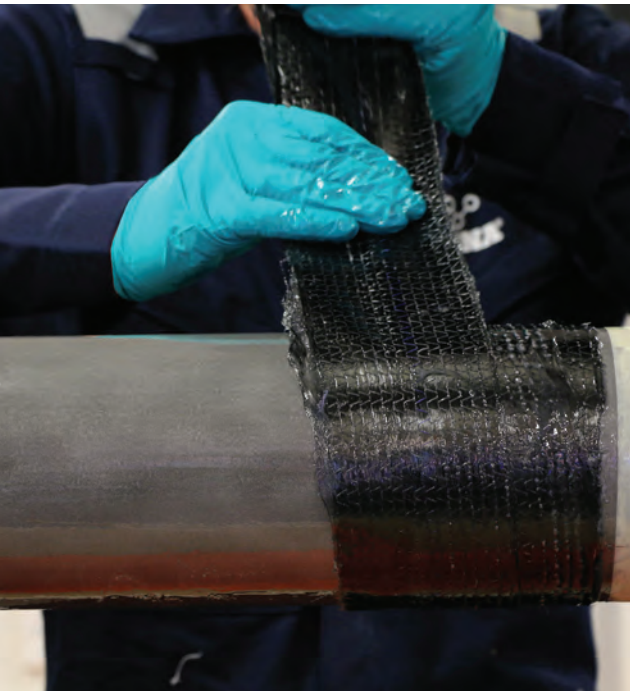
Repair of a large wastewater clarifier suffering erosion and chemical attack



Clarifier track rebuilt and protected

Global Application Standards

Belzona solutions for machinery and equipment.



Prequalification

Belzona materials undergo rigorous independent and in-house testing, which is documented in the product specification sheets and chemical resistance charts. Testing is conducted in our ISO 9001-audited laboratory, adhering to recognized standards such as ASTM, ISO, and NACE.

Belzona products are approved by classification societies and companies worldwide, including Lloyd's Register, DNV GL, ABS, CCS, RS, KR, WRAS, Bureau Veritas, NSF, NATO, GE Hitachi Nuclear Energy, Ford, and General Motors, among others. Additionally, our products have received endorsements from the U.S. Navy and the U.K. Ministry of Defence.



Application

Application standards, especially regarding surface preparation, are crucial for the successful implementation of solutions. Belzona is committed to establishing and monitoring global application standards.

Applications are carried out by experienced and trained personnel. Belzona offers comprehensive training programs, including theoretical and practical courses, as well as on-site training. In conjunction with specific application specifications, method statements, quality control procedures, and daily inspection reports, we aim to uphold high application standards.



Specification

The optimal materials and application procedures are chosen to meet the specific design and operating conditions of each asset. Dedicated Belzona-trained specialists, along with round-the-clock technical support from our head office, ensure that the correct materials and application procedures are specified.

Additionally, we maintain a comprehensive database accessible to the global Belzona Distributor Network. This database facilitates the sharing of information and experiences, enhancing the specification and application standards.



Inspection

Inspections are conducted by certified inspectors (e.g., NACE) before, during, and upon completion of the application to ensure that Belzona systems are applied according to our standards and the client's requirements.

As the system approaches the end of its expected service life, the asset is inspected once more. Based on this inspection, appropriate recommendations are made, which may include minor repairs or no action at all, as Belzona systems often exceed their projected service life.



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

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