

Common maintenance problems such as corrosion, erosion, chemical attack, and structural damage are often found throughout petrochemical processing facilities. These problems deteriorate machinery and equipment used at the petrochemical plants.

Belzona engineers metal repair composites, concrete repair composites, and chemical- and abrasion-resistant coatings and linings to solve common maintenance problems. Belzona solutions can be applied in-situ and offer unmatched performance in tough application areas. Our materials have been proven to reduce downtime and labor costs as well as increase the efficiency of machinery and equipment and ensure environmental compliance. We can provide solutions for the repair and protection of your facility, including:

- *Pipework and spools*
- *Loading areas*
- *Chemical containment areas*
- *Storage tanks*
- *Process vessels*
- *Pumps*
- *Heat exchangers*
- *Walls, roofs, and floors*



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



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ISO 9001:2008  
Q 09335  
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This process flow chart of a typical petrochemical processing facility. It is designed based on data retrieved from various sources. It is to be used as general guidance only. It describes the most common repair and maintenance problems found in petrochemical processing facilities together with Belzona solutions which could potentially help mitigate such problems. It does not aim to supersede any drafted process flow charts in use at these facilities. It is strongly recommended that each user of this guide contact the local Belzona representative to discuss the specific needs and operation conditions of their petrochemical processing facility.

<b>WALLS</b>  <b>TYPICAL PROBLEMS:</b> Deterioration of concrete, stonework and construction joints failure due to erosion-corrosion, chemical attack, physical impact and structural movement.  <b>POTENTIAL SOLUTIONS:</b> Belzona 2000, 4000 and 5000 series paste- and fluid-grade materials for waterproofing, concrete and stonework rebuilding and protection of the external and internal walls, and for the repair, replacement or installation of construction joints.	<b>ROOFS</b>  <b>TYPICAL PROBLEMS:</b> Weathering and/or physical damage to roofs and roof parts: joints, seams, edges, glazing sections, gutters, flashings, skylights, parapet walls and copings, pipes and pipe supports. The damage is typically caused by ineffective joint seals, weather and freeze-thaw cycles, failure of roof materials, substrate movement or impact.  <b>POTENTIAL SOLUTIONS:</b> Belzona 3000 series flexible membranes for weatherproofing, waterproofing, repair and protection of all roof types and roof parts.
<b>LOADING AREAS</b>  <b>TYPICAL PROBLEMS:</b> Damage and deterioration to concrete including areas such as: floor areas, expansion joints, spalling concrete, stair treads, channels, dry joints and gratings caused by chemical attack, physical impact, freeze-thaw and expansion joint failure.  <b>POTENTIAL SOLUTIONS:</b> Belzona 1000, 2000, 4000 and 5000 series paste- and fluid-grade materials offer concrete restoration and levelling, expansion joint repairs, floor slip resistance and safety markings.	<b>CHEMICAL CONTAINMENT AREAS</b>  <b>TYPICAL PROBLEMS:</b> Deterioration of containment area as well as mechanical or structural damage caused by: acid attack, pH reduction, carbonation, sulphate attack, caustic attack, microbial degradation, corrosion of reinforcement and abrasive wear. Breakdown of the concrete can lead to a loss of integrity and strength, increased porosity and environmental risks.  <b>POTENTIAL SOLUTIONS:</b> Belzona 4000 series materials for the repair and protection of concrete subject to abrasion, impact, and chemical attack such as concentrated acids. Belzona 5800 series for protection from physical, chemical, or bacterial attack in a diverse range of environments.
<b>STORAGE TANKS</b>  <b>TYPICAL PROBLEMS:</b> Issues such as: tank base corrosion, interior linings affected by erosion, corrosion and chemical attack, external corrosion by weathering, corrosion under insulation, wall defects leading to leaks as well as UV and acid rain attack.  <b>POTENTIAL SOLUTIONS:</b> Belzona 1000, 2000, 3000, 4000, 5000 and 6000 series paste- and fluid-grade materials offering cold-applied repair solutions, long-term protection both internally and externally with a resistance to a wide range of chemicals and environmental damage, leak sealing, tank base sealing and cold bonding to tanks walls and roofs.	<b>PROCESS VESSELS</b>  <b>TYPICAL PROBLEMS:</b> Interior linings are susceptible to erosion and corrosion through constant attack from chemical solutions, accelerated by elevated temperatures and entrained solids. Deteriorated process vessel flanges and nozzles subsequently lead to corrosion and leaks.  <b>POTENTIAL SOLUTIONS:</b> Belzona 1000, 4000 and 5000 series paste- and fluid-grade materials for metal rebuilding and erosion-corrosion protection even at high operating temperatures. Complete vessel protection can be achieved through nozzle inserts and flange face forming, restoring damage and protecting against corrosion.
<b>PUMPS</b>  <b>TYPICAL PROBLEMS:</b> Prolonged exposure to erosion, corrosion, chemical attack, wear and cavitation, reducing the performance of the pump or leading to deterioration.  <b>POTENTIAL SOLUTIONS:</b> Belzona 1000, 2000, 4000 and 7000 series paste/fluid grade materials and coatings for the rebuilding of surfaces, long term corrosion and erosion protection, shaft repairs, wear ring reseating, pourable chocking for precise alignment and the increase of pump efficiency.	<b>HEAT EXCHANGERS</b>  <b>TYPICAL PROBLEMS:</b> Areas such as tube sheets, water boxes, flange faces, division bars and end covers can be damaged by erosion, galvanic corrosion, crevice corrosion and chemical attack.  <b>POTENTIAL SOLUTIONS:</b> Belzona 1000, 2000, 4000 and 5000 series offer a wide range of cold curing metal repair composites and epoxy coatings to restore deteriorated surfaces and provide long-term erosion and corrosion protection with high temperature resistance.
<b>PIPEWORK AND SPOOLS</b>  <b>TYPICAL PROBLEMS:</b> Erosion-corrosion and chemical attack leading to damage, deterioration and leaks, corrosion and wear in pipe support areas and corrosion of flanges and fastenings.  <b>POTENTIAL SOLUTIONS:</b> Belzona 1000 series 100% solids paste- and fluid-grade materials for metal rebuilding and corrosion protection. Belzona SuperWrap II for composite repairs, restoring the strength of corroded, weakened and holed pipes, whilst eliminating the need for hot-work. Available to be applied as a pipe wrap, composite patch or composite pad. Belzona 3000 series flexible membranes providing peelable systems used for encapsulating flanges and bolt fastenings against moisture ingress and corrosion.	