

BELZONA: FORGING SOLUTIONS FOR THE STEEL INDUSTRY

For around 70 years Belzona has dedicated itself to researching and developing solutions for various industries. It all began in the 1950s when a corrosion-resistant zinc coating was established. Throughout the years Belzona has found that polymer products have the resistance, strength, and versatility to be used in common but difficult problems.





Products have been developed to solve corrosion, erosion, abrasion, chemical and physical attack, wear, and weathering. Depending on the products, they can also be used in various environments regardless of substrate, heat, moisture, dry, or immersed in liquid.

The steel industry and its operations can benefit from the advantages of using Belzona products. It is not hard to imagine that steel mills are harsh environments. The machinery and equipment used throughout the facilities are susceptible to all the problems that Belzona has dedicated itself to solving.

Facilities, as a structure, undergo their own set of problems. In addition, solids handling equipment, liquids and gas handling equipment, containment areas, machinery, and pipelines are consistently damaged. It might be attractive to replace the assets; however, this may perhaps be costly and tedious seeing as new assets are expensive and downtime can negatively affect operations.

BELZONA, ON THE OTHER HAND, CAN COUNTERACT THESE PROBLEMS TOO.

We have engineered our products to cure quickly—some of our products are ready for use in just a few hours. In most instances, our solutions are more cost-effective than a full replacement.

The following examples are successful applications in the steel industry that resolve some of the common problems that a steel mill might confront.

ABRASION RESISTANCE AND SOLIDS HANDLING



Damaged belt

At a metal foundry in Spokane, Washington, a piece of equipment got damaged: a metal part caught the rubber belt tumbler inside the shot blast machine during operation and severely ripped the belt. It was estimated that a replacement belt could cost over \$4,000 and would take three days to replace. The company was in the middle of a major order and could not shut down for that length of time which would have been required to replace the part. To avoid a lengthy downtime, Belzona was chosen and as a result the repair cost a fraction of the replacement cost and only took a day to complete.

HOW-TO

The repair began by removing the guard plate to allow for more access to the interior of the machine. The loose material was cut away and the substrate was prepared with a roughening brush. A sheet of plastic was slipped underneath the belt to prevent the belt from attaching to the metal drive rollers and to ensure mobility after the repair. First, Belzona 2911 conditioner was applied to the rubber belt. Then two coats of Belzona 2211 elastomer and Belzona 9341 reinforcement sheet were applied to the seams. Finally, heat lamps were used to maintain an optimum curing temperature.



Roughened up area ready for application



*Application completed and covered
with plastic*



2 weeks later after use

FLUID AND GAS HANDLING EQUIPMENT

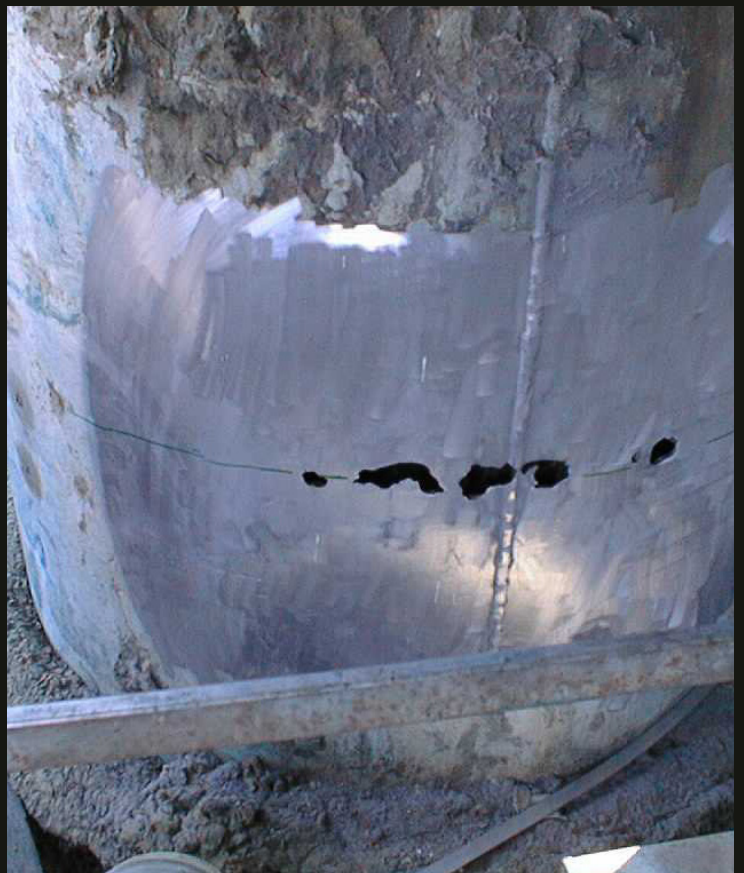
At a steel mill in Germany, storage tanks were experiencing corrosion on their walls and connection points. These tanks stored a corrosive medium, coke gas in water and local steam. The temperatures of the tank ranged from 122°F to 219°F (50°C to 104°C).

HOW-TO

A metal square was cut to a large enough size to cover the corroded area and curved to fit the contours of the tank. Belzona 1111 metal rebuild composite was applied to the surface of the metal square and the corroded substrate. Metal strapping was placed over the application to hold the square against the tank wall as the product cured. The excess material was used as a filler around the plate. After the completion of the cure, the straps were removed.



The corroded tank



Preparation



Fitting the plate



Finished application

CONTAINMENT AREAS



Trough prior to surface preparation



Trough profile reformed with Belzona

A steel mill was looking for a repair system for their eroded trough or a new trough entirely. They considered Polyurea coatings but decided against it due to their intolerance of damp concrete. They had also considered a new stainless-steel trough. However, Belzona was \$65,000 less expensive and offered the longevity and requirements set by the situation. Their problem was a badly eroded trough that conveyed highly abrasive waste material. It was rapidly deteriorating the asset by carving out a larger cross-sectional area than what was originally designed. The flow velocity dropped signifying the trough was not working as intended. Lastly, waste was building up within the trough.

HOW-TO

After deciding to use Belzona to repair the problem, the substrate was abraded to create a good quality profile so the product could adhere better. Then, the surface was cleaned. Belzona 4124 was used to fill in the eroded areas of the trough. Then, the areas were resurfaced with Belzona 4111, which was applied at a thickness of a quarter of an inch. Finally, Belzona 1812 was applied to provide abrasion resistant barrier to the trough.



A further quarter inch of Belzona 4111 applied



Trough fully coated with Belzona 1812

SHIMMING OF WORN EQUIPMENT

At a facility in Slovakia, a lathe was installed but it required a solid foundation. The situation required a solution that could withstand the compressive load of machinery and reduce vibrations. Normally the lathe would be bolted to the floor, but this does not prevent corrosion or damage to the baseplate due to vibration. After consideration Belzona 7111 was chosen as the appropriate product for the application.

HOW-TO

To start, the surface was prepared by degreasing it with Belzona 9111. Belzona 9411 (Release Agent) was applied to any surfaces which would be in contact with Belzona 7111 to allow for future removal of the equipment. Then, a wooden dam was built around the perimeter of the lathe about half an inch away from the baseplate. Belzona 7111 was slowly and carefully poured within the dam and allowed to freely flow across

and underneath the machinery. Once the product was cured the dam was removed. This provided the long-term solution the company needed.



Installed lathe required a solid foundation



Temporary wood dam prepared



Pouring Belzona 7111



Final Application

FACILITIES MAINTENANCE



Pipe prior to application

A facility in Spain had a problem with an exposed hot pipeline causing a hazard to the personnel working there. The pipeline was operating in a contaminated area. Due to this, the original insulation material degraded over time causing the temperature of the pipeline to spike to an unfit range of 80°C to 100°C. The surface must be below 60°C to be considered safe. The facility believed Belzona 5871 was a good safety measure for the problem.

HOW-TO

Manual preparation tools were used to remove corroded material and create a rough surface on the profile to aid in adhesion. Belzona 5871 was applied at a 1.5mm wet film thickness to achieve a dry film thickness of 4.5mm. Alternative solutions included reinstatement of traditional insulation, which would have taken much longer to install, therefore increasing the downtime. Due to the single-layer application of the Belzona 5871, a sufficient curing time was achieved within a preferable 6-hour downtime window. Most importantly, the temperature of the pipeline was able to be brought down below the required 60°C to under 55°C.



Surface preparation completed



Application completed



Surface temperature after curing

THESE ARE JUST A FEW EXAMPLES OF THE BENEFITS OF USING BELZONA IN STEEL MILL FACILITIES AROUND THE WORLD. BUT THE PRODUCTS ARE NOT LIMITED IN THEIR UTILIZATION. BELZONA HAS VARIOUS SERIES OF PRODUCTS THAT SPECIALIZE IN DIFFERENT AREAS AND WITHIN THOSE AREAS, THEY CAN BE USED TO REPAIR AND IMPROVE COUNTLESS SITUATIONS.

Additional Examples of Applications At Steel Mills And Steel Making Facilities:

REPAIR AND PROTECTION OF A CONDENSATE TANK



Before: A corroded condensate tank



After: A condensate tank reprofiled with Belzona 1111 and coated with Belzona 1593

A FLOOR GRIP SYSTEM TO ENSURE SAFETY



Before: A facility floor without slip-resistance



After: Belzona slip-resistant floor system (Belzona 5811 with Belzona 9211 aggregate) installed.

PANZER BELT REPAIR FOR E-CRANE

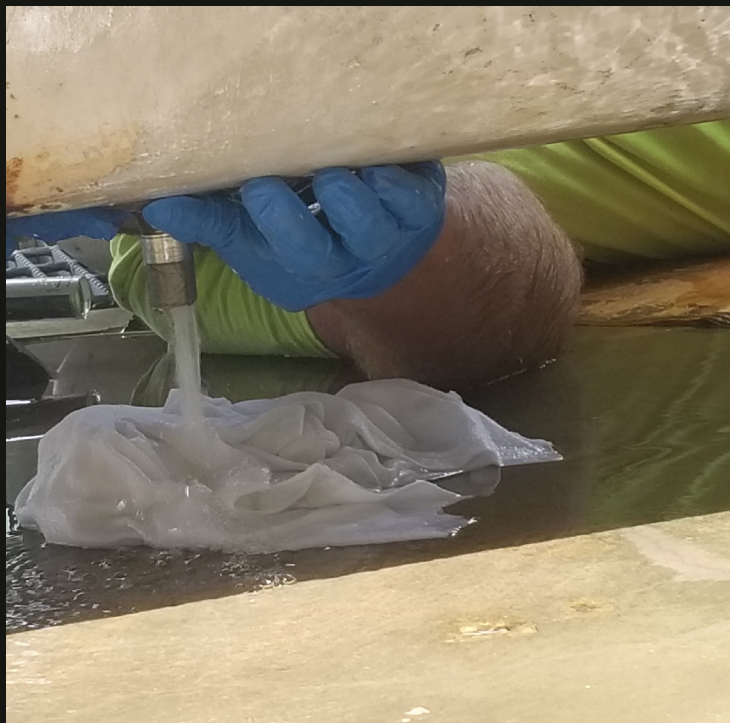


Before: Damaged panzer belt due to abrasion



After: Panzer belt repaired with Belzona 2211 & Belzona 2911

PIPE SADDLE LEAK



Before: An active leak



After: Live pipe leak repaired using Belzona 9611, Belzona 1212, & Belzona 9411 reinforcement sheet