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PRESS INFORMATION

Total Flange Protection: Challenge Accepted!

In June 2014, the Plant Maintenance Manager of a chemical plant in South Louisiana, USA contacted Belzona requiring an alternative flange corrosion protection solution.

The plant had a 52" flange on a vessel connecting to outlet piping that needed corrosion protection. The flange was affected by crevice corrosion, a well-known damage mechanism in petrochemical facilities caused by the concentration of corrosive substances within a confined space. The crevice between two adjoining flanges is the ideal environment for initiation of crevice corrosion and the corrosion rate is accelerated by the concentration of these corrosive substances in a confined area. Corrosion of the sealing area can lead to loss of containment and the potential to cause product release with catastrophic consequences.

[52" flange on vessel in need of corrosion protection]

To avoid corrosion between the flange faces, a previous protection solution consisting of a fiberglass system was used on other vessels in the unit. Fiberglass offers good corrosion resistance but these materials can however be time-consuming and expensive to apply. If access to bolts is required for flange maintenance, fiberglass can be cut away, but it is difficult to remove and normally must be replaced with a new system to reinstate the protection.

In order to avoid these drawbacks, the client was looking for an alternative and more cost-effective protective solution that allows for a simple installation, is suitable for all flange sizes and shapes, and permits easy access for inspection purposes. Belzona 3411 (Encapsulating Membrane) was recommended as the system provides a complete corrosion protection for flanges, fastenings and associated pipes, and can be easily applied and peeled back for maintenance purposes. The system offers full corrosion protection due to its use with a dual use corrosion inhibitor/release agent, Belzona 8411, and the high adhesive properties of Belzona 3411 excludes any moisture.

The application was carried out by the plant personnel in accordance with Belzona's application procedures. All surfaces to which the Belzona 3411 system was to bond to were cleaned with Belzona 9111 (Cleaner/Degreaser) to remove all dirt, grease and surface contaminants. The bond areas also required surface preparation to

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ensure good adhesion. The minimum level of surface preparation for exposed/corroded steel is wired brushing to ISO 8501-1 St 2/SSPC SP-2. As the surfaces had been previously painted, the bond area were thoroughly abraded with abrasive paper to remove all gloss and provide a good key for the coating system.

[Belzona flange encapsulating system]

The gap between flange faces was sealed with a strip of bond breaker tape and the two bond areas were mashed off to protect these sections of pipe from accidental overspray of Belzona 8411, and hence impaired adhesion. The system requires the use of Belzona 8411 to achieve the optimum level of corrosion protection and to allow access to bolts and flanges in the event of required maintenance. Belzona 8411 can be simply spray or brush applied onto the flange, pipe and fastenings ensuring the film coverage is even and complete. Once Belzona 8411 was touch dry, the masking tape over the bond areas was removed and plastic caps fitted over the bolts.

[Tape applied around the gap between the flanges faces]

Belzona 3411 is a two-coat system, comprising a grey and a beige layer. The mixed Belzona 3411 was applied over the area to be protected using a short bristle brush at a thickness between 30 and 40 mils (750 - 1000 microns). The entire content of a further unit of mixed Belzona 3411 in beige colour was brush applied onto the touch dry first coat to finish the application.

[First layer of Belzona 3411 applied]

[Belzona 3411 system fully applied]

This encapsulating system can not only be used to provide an excellent corrosion protection for the flanges, fastenings and associated pipes but also as a preventive system which helps facilitating and improving monitoring and inspection of flange faces. The customer saved several thousand dollars over the previous fiberglass

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system with easier installation. When the vessel has to be opened, the technician can use a box knife instead of a heat gun or grit blast equipment to remove the system. Indeed, when maintenance or inspection is required, the system can be simply cut open by using a sharp knife to cut through the membrane in the gap between the flange faces around the circumference of the flange. The membrane will be then be peeled back, exposing bolts and flanges. Once the required maintenance has been completed, the membrane will fold back to its original position and can be sealed with a further quantity of Belzona 3411.

The unit was inspected 90 days after installation and it looked as good as it did on day one. The application was revisited in April 2015 and the protection was still a perfect condition. The client was very satisfied with the Belzona solution and is planning to use Belzona 3411 on other flanges in the plant.

[Flange in perfect condition after 10 months in service]

Notes -

- Belzona was first established in 1952 in Elland, West Yorkshire before moving to its current Head Office in Harrogate in 1992.
- Belzona is a world leader in the design and manufacture of polymer repair composites and industrial protective coatings for the repair, protection and improvement of machinery, equipment, buildings and structures.
- Belzona is not just a product but a complete service with a global distribution network of over 140 Distributors operating in 120 countries.
- Belzona operates from four corporate offices in Harrogate, UK, Miami, USA, Chonburi, Thailand and Ontario, Canada.
- At Harrogate, the full Belzona product range is manufactured to stringent quality and environmental control guidelines complying with the requirements of ISO 9001:2008 and ISO 14001:2004.

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Alice Jucquois studied at the University of Lincoln, United Kingdom, and holds an MSc Degree in Marketing. Alice is part of Belzona Polymerics Ltd Marketing Department, where she is responsible for the marketing strategy for the French speaking countries and development of brand awareness through PR activities.

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