

INGRESS & CORROSION PREVENTION

Enviropeel is often applied to bolted joints on pipes where substantial areas of coating are still intact but with vulnerable joint and bolt areas showing signs of corrosion, as seen in Fig.1 below. This type of localized failure is typical of jointed systems, where flanges and bolts retain moisture and are subject to galvanic effects, corroding much faster than the main substrate.

A standard Enviropeel application, as shown in Fig.2 above, encapsulates all the vulnerable areas, including those with existing corrosion, continuing the coating until it overlaps an area of intact coating. All at risk components are locked in a moisture-free, inhibitor-rich environment, away from any potential ingress and protected from galvanic effects. This stops all further rust - even on mixed substrates with carbon-steel bolts in stainless joints, which are extremely vulnerable to



Fig.2

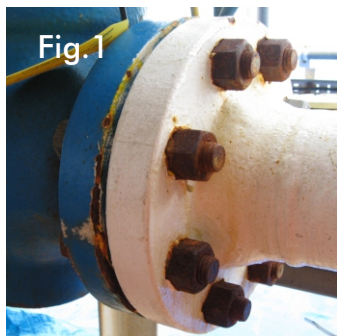


Fig.1

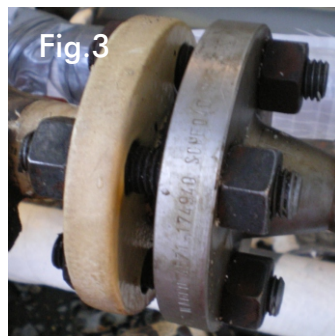


Fig.3

the effects of galvanic corrosion. In the example shown in Fig.3, a mixed substrate with bolts that were already starting to corrode was coated with Enviropeel. Without protection, the bolts would have failed within eighteen months - yet, as can be seen, no corrosion has occurred within the encapsulation despite years of exposure to a hostile offshore environment.

All carbon steel will corrode in wet, particularly saltwater environments but, if you can prevent ingress of moisture and, in the case of Enviropeel, create an environment free from galvanic effects, the level of protection is remarkable. Shown in Fig.4, after a 3000-hour hot salt fog test on an unpainted carbon-steel flange, the areas that were protected by Enviropeel are clearly defined by the immediate change from uncorroded steel to high levels of exfoliating rust.

Despite such examples, the question of ingress protection at the edge of the encapsulation is one that is often raised by newcomers to Enviropeel technology, so it was decided that a test should be conducted that would test the impermeability of the encapsulation as a whole but which would also focus on the potential for ingress at the edges.



Fig.4

KEY PROTECTIVE FACTORS

Impermeable coating fits all substrates

No ingress of moisture & contaminants

Inhibitors prevent galvanic effects



On a vertical pipe there is more potential for problems but the right application techniques will prevent ingress even in the worst possible circumstances. In these extended salt-water deluge tests, the ability of Enviropeel to prevent corrosion in vulnerable areas is clearly demonstrated.

For the test, an uncoated carbon steel pipe and flange test piece was placed in a constant stream of 20% salt water. To emulate splash zone conditions, the water flow was turned on and off on a 12 hour cycle. The tests were conducted in a tropical environment with ambient temperatures between 80° and 100° Fahrenheit.



Fig.6



Fig.7

To ensure no protection of any kind was on the substrate, a 15cm strip was abraded with an angle grinder (to remove mill scale etc) along the whole length of the pipe.

The test was run over three months, following which the Enviropeel was cut away to reveal the results.



Fig.5

Fig.5 above: substrate and Enviropeel encapsulation shortly after the beginning of the trial. On potentially vulnerable edges, cable ties provide extra security.

Fig.6 left: two weeks into the trial, the circular water delivery system can be seen at the top of the photo.

Fig.7 bottom left: substrate after three months, just prior to removal of Enviropeel.

Fig.8 bottom right: strips of Enviropeel have been removed to reveal the substrate below.



Fig.8



Fig.9 above: the removal of the mill scale is clearly visible

Fig.10 above right: following removal of all the Enviropeel material from the joint, the level of protection is clearly visible - no rust or staining to be seen.

Figure.11 below: cutting through the sealing tie reveals a sharp line between the protected and unprotected areas of



Spray-applied to fit perfectly around every contour of the substrate, Enviropeel cools and contracts on to the substrate, with a constant release of inhibiting oils, preventing moisture from entering the interface. Where there is likely to be substantial or sustained water pressure, extra material is applied and cable ties are employed to provide extra security. Sealing upper edges securely is particularly important as these are the areas that are subject to the most rain and water flows.

As this images show, despite the high salinity and constant flow of water, no corrosion or penetration of any kind can be seen within the Enviropeel encapsulation.

Technical information, equipment details and safety data sheets are available on our website, where there is much more information on the Enviropeel range of advanced reliability systems.

Contact us for advice and availability in your area

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