Zerust® Transparent Flange Saver®

PROTECT FLANGE ASSEMBLIES WITH A CORROSION INHIBITING WRAP

The Problem

Flange, valve and welded-joint corrosion costs clients millions annually!
- Complex geometry of flanges prevents effective surface preparation and coating
- Frozen nuts and bolts
- Weakened weld joints
- Loss of containment

The Impact

- Maintenance costs
- Downtime required for dismantling corroded flange assemblies for inspections, equipment removal, flange blinding, etc.
- Hot work repair of severely corroded flanges adds to downtime and costs
- Labor and equipment repairs and logistics can be costly, especially for offshore facilities
- Unscheduled stoppages due to corrosion-related leaks.

The Solution

Below outlines the features for the solution, Zerust Transparent Flange Savers.
- Rugged & transparent UV-resistant film cover designed for severe outdoor exposure.
- Proven Zerust Vapor Corrosion Inhibitor (VCI) in film.
- Easy installation and removal in minutes without special equipment.
- Transparent film allows for visual monitoring of corrosion and/or leaks inside the Flange Saver.
- Provides up to four years of corrosion protection in outdoor and offshore environments.
- Inexpensive, simple, highly effective and versatile.
- Inhibits additional corrosion even after corrosion has started; little/no surface prep required.
- Sized to fit standard flanges; custom sizes may be special ordered.
- Provides corrosion protection for FPSOs, jetties, offshore platforms & rigs, and other applications.

Zerust Flange Saver®
Zerust ReCAST-R™
2012 Winner of the MP Readers’ Choice NACE Corrosion Innovation of the Year award
### Transparent Flange Saver Benefits

*Maintenance time is significantly reduced*

*Maintenance costs can be more than halved*

*Quick and easy installation and replacement*

*No electrical devices or heating equipment required*

*No special training or certification required for installation*

*Effective life of up to 4 years before replacement (depending on client requirements)*

*Resistant to UV and harsh climatic conditions*

*Transparent film allows visibility to flange assemblies inside the enclosure*

*Individual client results may vary*

### Solution Effectiveness

Clients have been successfully installing Flange Savers on offshore and coastal facilities since 2009.

Offshore clients have experienced 75%+ reduction in corrosion repair costs and coating maintenance.

Maintenance downtime due to flange corrosion is greatly reduced.

### How Zerust Vapor Corrosion Inhibitors (VCIs) Work

- VCI molecules are released from inside the film into the enclosure.
- The molecules adsorb onto metal surfaces and form a protective layer.
- When the film enclosure is removed, the VCIs dissipate.

### Cost Impact of Flange Corrosion

<table>
<thead>
<tr>
<th>Annualized Flange Maintenance Costs</th>
<th>Indirect Flange Corrosion Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost of replacement flange</td>
<td>$12</td>
</tr>
<tr>
<td>Cost of nuts and bolts</td>
<td>$12</td>
</tr>
<tr>
<td>Cost of paint</td>
<td>$4</td>
</tr>
<tr>
<td>Peeling/priming/painting/welding</td>
<td>$5</td>
</tr>
<tr>
<td>Scheduled flange replacement</td>
<td>$20</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>$53</strong></td>
</tr>
</tbody>
</table>

**TOTAL** $53

Assumptions:

- ~ 10 years to flange failure due to crevice corrosion
- Average 6” diameter pipeline and API 6A Class 150 flange pair at cost = $120
- 8 sets of nuts and bolts for this pipe-to-pipe flange @ $3 per set, 50% replaced during the life of the flange
- Hourly low skill labor rate = $20/hour and high skill labor rate = $50/hour

### Material Performance

<table>
<thead>
<tr>
<th>Developed for Tough Field Conditions</th>
<th>Corrosion Rate: 30 Month Client Usage</th>
</tr>
</thead>
<tbody>
<tr>
<td>UV-Resistance</td>
<td>4 years of exposure</td>
</tr>
<tr>
<td>Tensile Strength</td>
<td>21k Mpa</td>
</tr>
<tr>
<td>Elongation</td>
<td>800%</td>
</tr>
<tr>
<td>Service Life</td>
<td>4 years</td>
</tr>
<tr>
<td>Shelf Life</td>
<td>4 years</td>
</tr>
</tbody>
</table>

### Order Specifications

Zerust Transparent Flange Savers are available in sizes compatible with international standards. Please contact your sales representative for the correct product recommendation for your application.