

#### CREDENTIALS

40+ years of experience in corrosion prevention.

Client support in 50+ countries.

Chair key task group at NACE International.

#### MEMBERSHIPS



Zerust Flange Saver®  
Zerust ReCAST-R™  
2012: Winner of the MP  
Readers' Choice NACE  
Corrosion Innovation of the  
Year award

# 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



Flange Corrosion

## 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.



Transparent Flange Savers in Use



## 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

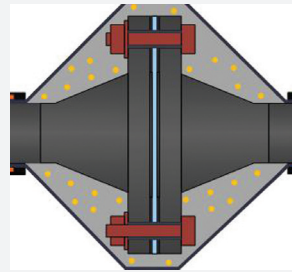
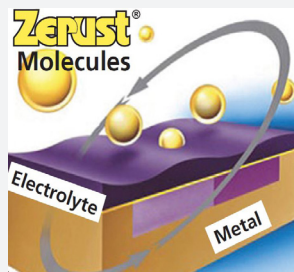
## Solution Effectiveness

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

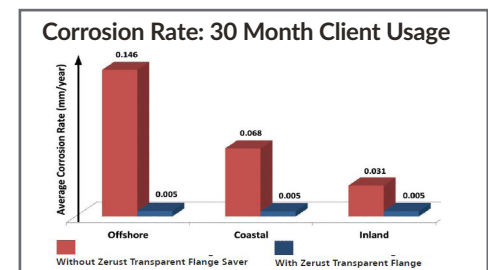
Annualized Flange Maintenance Costs		Indirect Flange Corrosion Costs
Cost of replacement flange	\$12	<ul style="list-style-type: none"> <li>• Labor + Time to torque open frozen nuts and bolts</li> <li>• Time required to secure hot work permits, purging, certification, etc. if shearing of flanges is required.</li> <li>• Logistics of equipment required for inspection and maintenance in case of flange replacement – especially for offshore facilities</li> <li>• Delays in removal/replacement, blinding, etc. of critical equipment</li> <li>• Opportunity costs of downtime of pipeline</li> <li>• Risks of flange failure, leaks, cleanups, safety, litigation, etc.</li> </ul>
Cost of nuts and bolts	\$12	
Cost of paint	\$4	
Prepping/priming/painting/welding	\$5	
Scheduled flange replacement	\$20	
<b>TOTAL</b>	<b>\$53</b>	<b>TOTAL \$\$\$\$!</b>

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

Developed for Tough Field Conditions	
UV-Resistance	4 years of exposure
Tensile Strength	21 + Mpa
Elongation	800%
Service Life	4 years
Shelf Life	4 years



## 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.



Warranty and Disclaimer Information:

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**WORLDWIDE CORROSION SOLUTIONS**  
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