

Zerust® Transparent Flange Saver®

PROTECT FLANGE ASSEMBLIES WITH A CORROSION INHIBITING WRAP



Flange Corrosion



Transparent Flange Savers in Use

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 and downtime are time consuming and expensive!

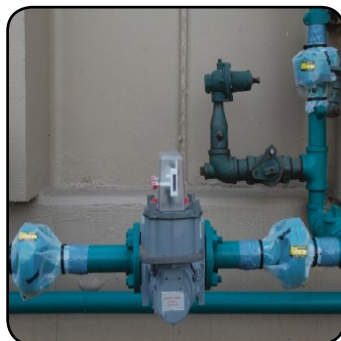
- Downtime required for dismantling corroded flange assemblies for inspections, equipment removal, flange blinding, etc.
- Hot work repair of severely corroded flanges adds to downtime and costs.
- Labor and equipment repairs and logistics can be costly, especially for offshore facilities.
- Unscheduled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

THE SOLUTION >>>

ZERUST TRANSPARENT FLANGE SAVERS

FEATURES >>>

- 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 AWARDS



Winner of the 2012 MP Readers' Choice NACE Corrosion Innovation of the Year award

CREDENTIALS

- 40+ years of experience in corrosion prevention
- Client support in 50+ countries
- Chair key task group at NACE International

MEMBERSHIPS



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).

VCI vapors are U.S.-FDA approved and therefore non-toxic.

Resistant to UV and harsh climatic conditions

Transparent film allows visibility to flange assemblies inside the enclosure

*Individual client results may vary

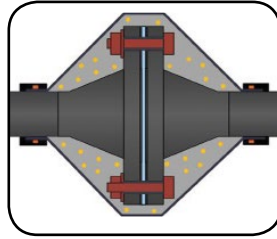
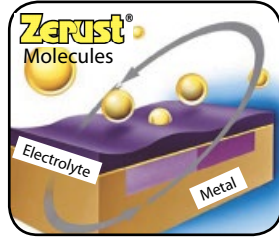
SOLUTION EFFECTIVENESS

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"> • Labor + Time to torque open frozen nuts and bolts • Time required to secure hot work permits, purging, certification, etc. if shearing of flanges is required • Logistics of equipment required for inspection and maintenance in case of flange replacement – especially for offshore facilities! • Delays in removal/replacement, blinding, etc. of critical equipment • Opportunity costs of downtime of pipeline • Risks of flange failure, leaks, cleanups, safety, litigation, etc. 	
Cost of nuts and bolts	\$12		
Cost of paint	\$4		
Prepping/priming/painting/welding	\$5		
Scheduled flange replacement	\$20		
TOTAL	\$53		TOTAL

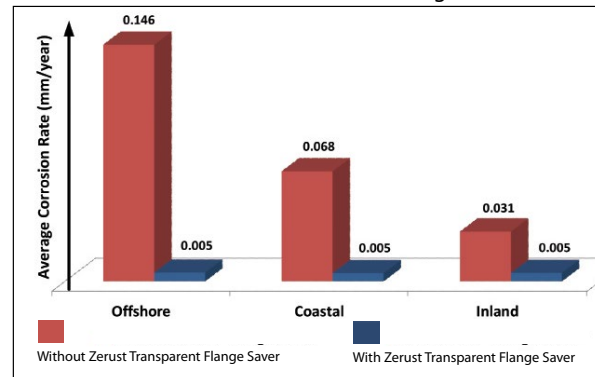
Assumptions:

- ~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%
Operating Temperature	-20°C to 80°C
Melting Point	105°C
Service Life	4 years
Shelf Life	5 years

Corrosion Rate: 30 Month Client Usage Data



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:

We guarantee our products conform to documented quality specifications. Product information subject to change without notice. We make no warranty of any kind expressed or implied as to the effects of use (including, but not limited to, damage or injury). Before use, Buyer/User shall determine suitability of the product for its intended use, and Buyer/User assumes all risk and liability in connection therewith. All statements, technical information and recommendations contained herein are based on testing and experiences NTIC believes to be reliable, but the accuracy or completeness thereof is not guaranteed. Buyer/User agrees that, if product proves to be defective, Seller's obligation shall be to replace or refund the purchase price of such product at Buyer's option. Seller shall not be liable in tort or contract for any loss or damage, incidental or consequential. See www.zerust.com/warranty

