



Thermal Sprayed Aluminum (TSA) Corrosion Protection System for the Offshore Oil and Gas Industry

Praxair's Thermal Sprayed Aluminum (TSA) Corrosion Protection System is an extremely durable system that provides total corrosion protection and significant life improvement over conventional barrier coatings. The TSA Corrosion Protection System features self-healing edges, can tolerate a 4 to 6% bare surface and does not require additional cathodic protection. It is ideally suited for a variety of marine, atmospheric, subsea and high-temperature applications. Users will realize significant savings in installed and long-term maintenance costs because the need for sacrificial anodes is reduced and coating repair is unnecessary.

Applications

The TSA Corrosion Protection System offers a wide range of benefits:

- Minimum need for maintenance
- Low cost
- Superior adhesion
- Excellent service life
- Resistant to mechanical damage
- No health hazard from solvents or other organic substances
- No drying/curing time; can be handled almost immediately after application
- Operating temperature range: -50°F to 1000°F (-45°C to 538°C)
- Provides a sacrificial anode effect on steel in marine environments
- Fast turn times



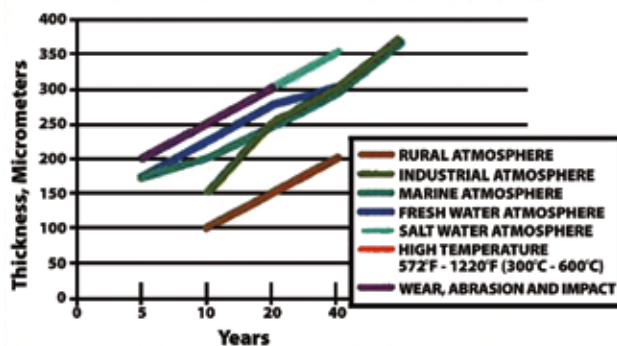
A buoyancy can (9.5' in diameter x 180' long) coated with the TSA Corrosion Protection System craned into a spar platform. The production riser and keel piping also were coated with the TSA Corrosion Protection System.



The TSA Corrosion Protection System functions as the sole source of corrosion protection for subsea piping.

Distributive Anode

In addition to being a barrier coating, the pure aluminum metal in the TSA Corrosion Protection System, when coupled with metals like steel (or those lower on the galvanic scale), will act as a sacrificial anode in a subsea environment. Rather than having to place anodes at certain intervals, the TSA Corrosion Protection System distributes sufficient anodic material over the full length of the component and functions as the sole source of corrosion protection for more than 30 years in seawater and saline mud with as much as 5% holidays.



Estimated Service Life of the TSA Corrosion Protection System

Typical Uses.

The TSA Corrosion Protection System is highly effective in a wide range of demanding applications for the offshore oil and gas industry:

- Risers
 - Production
 - Drilling
 - Catenary
- Subsea Pipelines
- Buoyancy Cans
- New Offshore
- Platform Retrofits
- Dock Pilings & Fenders
- Lifeboat Stations
- Flare Booms
- Access Bridges
- Escape Staircases
- Splash Zone Steelwork
- Ship Topsides

© Copyright 2010 Praxair S.T. Technology, Inc.
All rights reserved



Praxair and the Flowing Airstream design are trademarks of Praxair S.T. Technology, Inc. in the United States and/or other countries.

The information contained herein is offered for use by technically qualified personnel at their discretion and risk without warranty of any kind.

Praxair Surface Technologies, Inc.
1500 Polco Street
Indianapolis, IN 46222

www.praxairsurfacetechologies.com
psti-info@praxair.com

Telephone:
+1 317 240 2500

Fax:
+1 317 240 2255

Printed in the United States of America
11-2010

Printed on recycled paper
P-10310

Praxair Surface Technologies, Inc.
1500 Polco Street
Indianapolis, IN 46222

www.praxairsurfacetechologies.com
psti-info@praxair.com

Telephone:
+1 317 240 2500

Fax:
+1 317 240 2255

Printed in the United States of America
11-2010

Printed on recycled paper
P-10310

Praxair Surface Technologies, Inc.
1500 Polco Street
Indianapolis, IN 46222

www.praxairsurfacetechologies.com
psti-info@praxair.com

Telephone:
+1 317 240 2500

Fax:
+1 317 240 2255

Printed in the United States of America
11-2010

Printed on recycled paper
P-10310

Praxair Surface Technologies, Inc.
1500 Polco Street
Indianapolis, IN 46222

www.praxairsurfacetechologies.com
psti-info@praxair.com

Telephone:
+1 317 240 2500

Fax:
+1 317 240 2255

Printed in the United States of America
11-2010

Printed on recycled paper
P-10310

Praxair Surface Technologies, Inc.
1500 Polco Street
Indianapolis, IN 46222

www.praxairsurfacetechologies.com
psti-info@praxair.com

Telephone:
+1 317 240 2500

Fax:
+1 317 240 2255

The TSA Corrosion Protection System can be applied both manually and by an automated process specifically designed for straight-run pipe in sizes from 3 to 39 inches in diameter. Length capability for automated metallizing of piping is 25 to 75 feet. Internal diameter (I.D.) of piping can also be coated.



Praxair has developed an automated process for applying the TSA Corrosion Protection System to piping up to 75 feet long

Distributive Anode

Operating Temperature Range: -50°F to 1000°F (-45°C to 538°C) (NACE RPO198-98)

Corrosion Protection: Beyond Safe Threshold of -800mV Ag/AgCl

Available Thickness: 7 to 14 mils DFT

Full Length Distributive Anode:
Mechanically Bonded

Cathodic Protection: 99.5% Pure Aluminum;
Higher On Galvanic Scale Than Carbon Steel

Compatible With Most Metals