

## Thermal Sprayed Aluminum (TSA) Corrosion Protection System for the Petrochemical 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 high-temperature applications in the petrochemical industry. 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.

### Benefits

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**



*High-temperature compressor mufflers operating at temperatures up to 900°F (482°C), coated with the TSA Corrosion Protection System*



*Fabricated pipe spools from a petrochemical facility, coated with the TSA Corrosion Protection System to provide atmospheric corrosion control*

## Distributive Anode

Corrosion under insulation is one of the most difficult issues for petrochemical corrosion control. Repair and maintenance of insulated items is very expensive. In addition to the difficulty of identifying the location of corrosion under insulation, the repair of the protective coating required removal of the insulation and, in some cases, removal of the line or equipment from service. NACE RPO198-98 recommends the TSA Corrosion Protection System as the protective coating of choice for standard operating temperatures under thermal insulation.

## Application Process

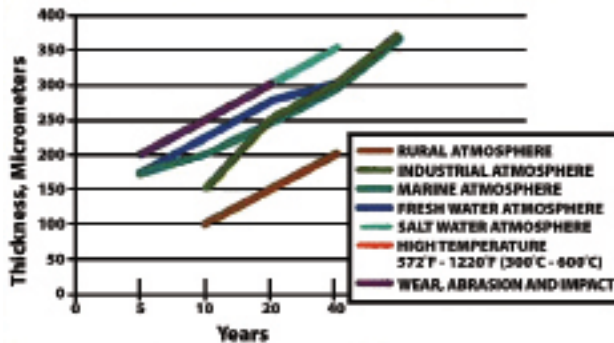
Praxair is a premier applicator of the TSA Corrosion Protection System and uses a specialized process to apply high-quality aluminum metal for corrosion control.

Electric arc spraying feeds two electrically conducting aluminum metal wires toward each other and produces an electric arc at the point just before the two wires meet. As the arc melts the metal wires, a high-pressure air line is used to spray fine droplets onto the properly cleaned and prepared steel surface. The arc spray process results in superior bonding (2000+ psi; ASTM C633) and high productivity.

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



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:

- Piping Under Thermal Insulation
- Cyclical Services—ambient to 1000°F (538°C)
- Piping
- Pipe Valves
- Tanks
- Vessels
- Flare Stacks
- Silencers
- Reactors
- Heat Exchangers
- Sheet Piling
- Fenders

## 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



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