

## Marine Boiler Air Pre-Heaters

Alonizing Corten tubes for marine boiler air pre-heaters extends their life by more than four times and provides a significant return on investment for the customer.

In this example, tubes were Alonized for two vessels owned and maintained by Marine Transport Lines of Secaucus, New Jersey, and operated on behalf of Charters Pennzoil Sulfur Company and Texas Gulf Chemical Company. These vessels hauled molten sulfur and were steam-turbine driven.

Each vessel's boiler had the same general operating characteristics. The smaller boiler had the following specifications:

- Working pressure: 450 psi
- Design pressure: 500 psi
- Super heat temperature: 730-764°F
- Total steam demand: 64115-88875 pounds per hour

When underway, incoming air is passed through a typical air preheater configuration. The air preheater had 900 tubes, 1.5" OD x #14 gauge x 85.5" long.

The tubes were subject to various types of corrosion, both from the marine environment to which they were exposed and due to the fact that dilute sulfuric or sulfurous acid can form at the cold end of the heat exchanger tubing, developing highly corrosive environments.

Corten material had been ordered to gain some measure of corrosion resistance, but Corten tubes generally had a life of no more than 12 to 18 months.

Alonized Corten tubing was put in place in the first boiler as replacement tubes. Installed in November of 1990, the expectation was that they might last for four years. Were this to happen, total savings for that boiler were estimated to amount to almost \$200,000 for the four-year period.

After three years, it became apparent that the tubes would greatly outlast the original four-year projection, since periodic inspections revealed them to be in virtually "day one" condition.

The second boiler was retubed with Alonized Corten tubing in 1992 and that air preheater exhibited the same characteristics of corrosion-free performance.

## Endurance Technologies Contact Information

Jim Wyatt  
7940-56th Street S.E.  
Calgary, Alberta, Canada  
(403) 236-6081  
jim.wyatt@endurancetechnologies.com  
www.endurancetechnologies.com