



DREEM POLYMER™ – SIGNIFICANT PERFORMANCE IMPROVEMENT OF A LOW-PRESSURE SYSTEM

Enhanced Boiler Efficiency & Reduction of CO₂ Emission

KEYWORDS

- Boiler water
- Small once-through boiler
- DReeM Polymer
- Scale removal
- Scale prevention
- Efficiency improvement

Boiler efficiency improvement

-1%
CO₂ emission reduction

-15%
Exhaust gas temperature

BACKGROUND

An important Japanese laundry uses several small size once-through boilers for its steam supply. The make-up water is prepared by raw water softening. Due to malfunction of the softener hardness ingress into the feed water occurs regularly. Traditional treatment programs and scale preventive technologies failed under these severe conditions. Scale formation with more than 0.02 inch thickness has been observed on the inner system surface of the entire tubes which led to significant boiler efficiency loss.

As a solution, Kurita applied the patented DReeM Polymer Technology for prevention and removal of scale during normal operation of the boiler.

Main components of the scale have been analyzed as followed in the chart to the right.

Component	Weight percent
Calcium oxide	30 %
Acid-insoluble matter	22 %
Phosphate	20 %
Magnesium oxide	10 %
Iron oxide	4 %

SYSTEM DESCRIPTION

Type of industry	Laundry
Type of boiler	Small once-through
Make-up water	Softened
Feedwater temp.	158 °F
Pressure	130 psi
Steam production	4400 pounds/hour
Blow-down rate	8 %
Operation time	12 h/d

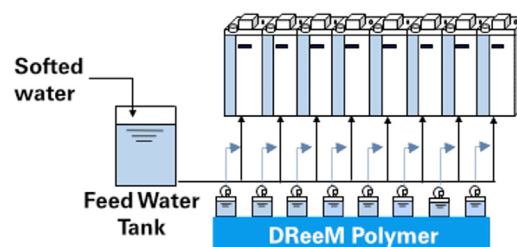


Figure 2.0: Installed Automation



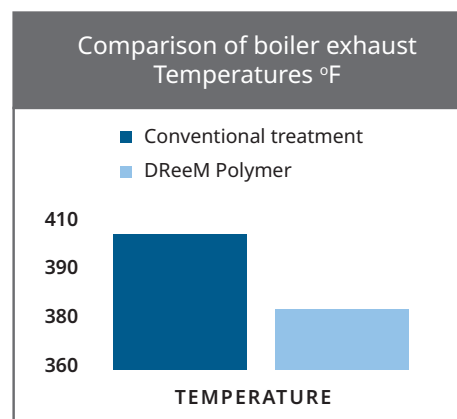
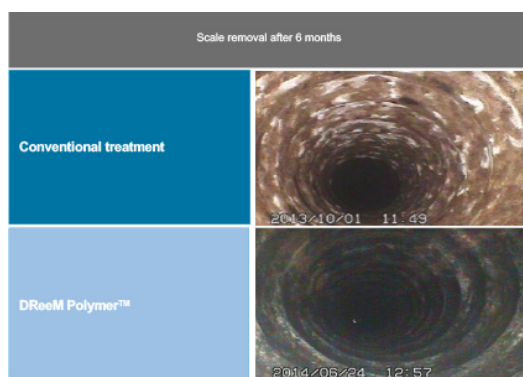
OBJECTIVES

- Remove scale during normal system operation (online cleaning)
- Improve boiler efficiency
- Treatment to prevent scale formation
- Avoid any risk of corrosion

ACTION/APPROACH

The boiler water treatment has been changed to a treatment concept based on DReeM Polymer Technology (dosed with a concentration of 150ppm to feed water). The key performance indicators (KPI's) – visual scale thickness and exhaust gas temperature – have been evaluated over 9 months to demonstrate the treatment success and system improvements.

ACHIEVEMENTS



- The scale has been removed almost completely within 6 months
- Exhaust gas temperature has been reduced by 27°F
- Boiler efficiency has been improved by 1%
- Annual energy savings of 82MMBTU gas per boiler have been demonstrated, leading to total savings of approximately \$14,000
- Total CO₂ amount is reduced by app 1%

CONCLUSIONS

The application of Kurita's DReeM Polymer Technology has solved the technical problems regarding scale formation on heated surfaces.

Based on these technical improvements economical savings of \$14,000 have been realized.

Now the customer can operate his boiler with an improved efficiency and saves costs for energy.