

# Fremont Focus Newsletter

**Inside this issue:**

Deposit Analysis	2
Steam Trap Analysis	3
Corrosion Coupon Analysis	4

**Fremont facts:**

- Fremont has been providing quality service and products for 57 years.
- Fremont products are manufactured in our ISO 9001 certified facility.
- Fremont has the most responsive shipping in the water treatment industry.

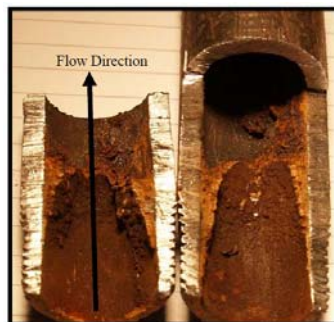
## Better Information Makes Better Decisions

When you become a Fremont customer you begin to understand the “Fremont Difference”. One of the major differences is the support that our customers receive from the Fremont laboratory. The laboratory team analyzes a variety of samples and collaborates with your Fremont account manager. The most effective water treatment program is then designed to address your specific needs. Fremont does not believe in a “one size fits all” water treatment approach. This newsletter contains examples of laboratory efforts; reprinted laboratory reports performed for Fremont customers or for plant audits of prospective customers.

### TECHNICAL SERVICE LABORATORY REPORT

**SUBJECT:** Steam Line Deposit Analysis

The submitted pipe nipple has been sectioned and internal deposit analyzed as requested. The deposit was found to contain predominately Magnetite which was “cemented” in place by Amine-Carbonates. Trace amounts of Copper and Zinc were also detected, perhaps representative of abraded particulate from a nearby brass valve.



**Photo 1.** Once the pipe was sectioned, it became apparent that the deposit was not the result of corrosion at this location. Rather, this deposit’s shape indicates that Magnetite was precipitated here due to decreased velocity (a by-product of PRV). Normally, this ultrafine particulate would be transported completely through the system, however here it has formed a “delta”.

Should further analytical work be needed, please feel free to consult the Water Management Solution Laboratory.

# FREMONT FOCUS: Fremont Difference

## Deposit Analysis Reports

DEPOSIT ORGIN: Reheat Boiler Tube Interior

DEPOSIT DESCRIPTION: Brittle, Black Flakes with Entrained Particulate

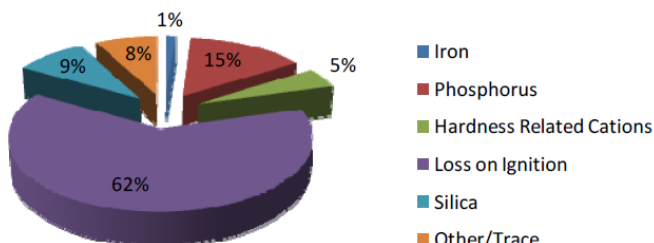
**SPECIFICALLY IDENTIFIED CONSTITUENTS:**

The sample was dried and ashed. Consequently, the elements were converted to the oxide form. Chemical analysis of the ash indicated the presence of the following (expressed as a percentage of ash):

TEST PARAMETER	RESULT	TEST PARAMETER	RESULT
Carbonate Spot Test	negative	Magnetic?	no
Loss of Ignition (875°C) <sup>a</sup>	62.58%	Ash Content (875°C) <sup>a</sup>	37.42%
<b>Elemental Composition of Ash</b>			
Calcium (as CaO)	3.1	Phosphorus (as PO <sub>4</sub> )	39.4
Magnesium as (MgO)	9.5	Iron (as Fe <sub>2</sub> O <sub>3</sub> )	3.1
Copper (as CuO)	0.1	Silicon (as SiO <sub>2</sub> )	23.9
Aluminum (as Al <sub>2</sub> O <sub>3</sub> )	0.8	Manganese (as MnO)	0.9
Sodium (as Na <sub>2</sub> O)	10.0	Potassium (as K <sub>2</sub> O)	1.3
Barium (as BaO)	lt 0.1	Zinc (as ZnO)	7.4
Other/Trace	0.3		

lt=Less Than  
<sup>a</sup>Calculated on dry weight basis

### Most Probable Deposit Composition



**Photomicrograph 1.** At 70X magnification, the deposit is revealed as an agglomeration of sand particulates, charred organics, hardness crystals, and other debris.

**COMMENTS:** The submitted pipe was segmented and one section’s deposit completely removed for analysis. Micro pitting was observed beneath the deposit, possibly the result of localized anion concentration (as a result of overheating due to fouling). Following ashing, acid digestion, and analysis via ICP instrumentation, the inorganic portion of the deposit was found to contain appreciable quantities of Phosphorous, Silicon, Sodium and Magnesium.

Should any additional questions or concerns arise, please feel free to contact the Water Management Solutions Laboratory.

## FREMONT FOCUS: Fremont Difference

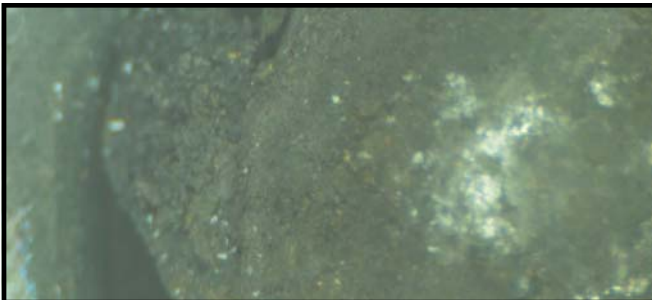
### Steam Strainer/Trap Corrosion Analysis Results

The submitted steam fitting has been examined as requested. Instrumental analysis of the deposit surrounding the ball revealed the material to be predominately Iron, with trace amounts of Copper, Lead and Chromium (from stainless steel).

The observed corrosion appears to be the result of under-deposit corrosion, abrasion and erosion corrosion. Ultrafine magnetite particulate, transported from well-passivated steam lines, has an electrostatic affinity for stainless steel. This affinity will allow small coatings of Magnetite to build on stainless steels and depending on physical and chemical conditions, lead to the failure observed in this sample.

Spirax/Sarco, the manufacturer of this steam trap, suggests maintenance 3-4 times a year on steam traps, with low-throughput traps requiring the most diligent inspection. It is not uncommon to replace all internal components when servicing a steam trap. Unfortunately, this particular trap's seat is not replaceable.

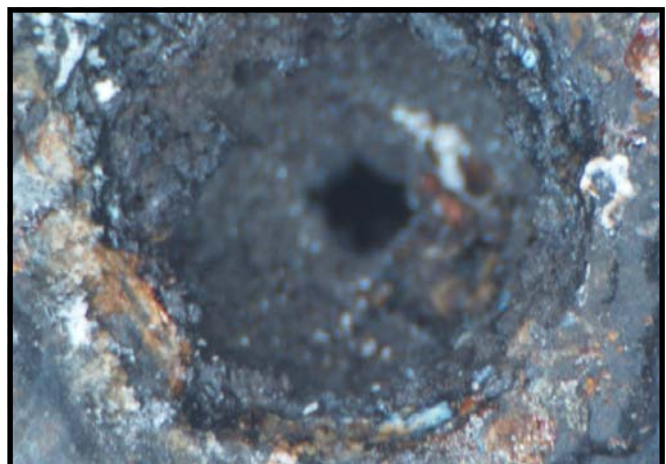
Should further analytical work be required, please feel free to consult the Fremont Water Management Solutions Laboratory.



**Photo 1.** Ball surface prior to cleaning.



**Photo 2.** Ball surface after cleaning with corrosion byproducts/magnetite deposits removed.



**Photo 3.** Ball "Seat" shows the evidence of general corrosion/abrasion prior to cleaning. The pinhole is centered (out of focus).

## Corrosion Coupon Analysis

CORROSION COUPON EXPOSURE DATA				
EXPOSURE SITE	EXPOSURE PERIOD (Days)	CHEMICAL TREATMENT PROGRAM	COUPON ALLOY	CORROSION RATE OBSERVED (MPY)
E Tower	244	Fremont 9575, 9115, and 9121	Copper	0.890
E Tower	244	Fremont 9575, 9115, and 9121	Mild Steel	0.410
F Tower	246	Fremont 9575, 9115, and 9121	Copper	0.102
F Tower	246	Fremont 9575, 9115, and 9121	Mild Steel	1.53
E Core Loop	244	Fremont 9910 and CE-411	Copper	0.021
E Core Loop	244	Fremont 9910 and CE-411	Mild Steel	0.065
F Core Loop	246	Fremont 9920 and CE-411	Copper	0.273
F Core Loop	246	Fremont 9920 and CE-411	Mild Steel	0.014

The eight coupons received on December 9, 2010 have been analyzed as requested. Should additional questions or concerns arise, please do not hesitate to consult the Water Management Solutions Laboratory.

A Fremont Account manager will gladly come to discuss the "Fremont Difference" with you to have the support of the professional Fremont lab in your operation.



Call today so you can start to experience the "Fremont Difference".  
(952) 445-4121