

**Cooling tower application - AquaKLEAR P100**

Customer: Milan Federal Correctional Institution, Michigan, USA

Dealer: Electro-Matic Products Inc., Michigan.

On August 10<sup>th</sup>, 2010, an AquaKLEAR P100 unit was installed on the 4" cooling tower return water line. Opposed to the manufacturer's recommendation, the water softening system was not disconnected due to the customer's concern the unit will not perform as advertised.



**Initial water tests:**

Conductivity - 2800  
Calcium - 300 ppm  
Bacteria - 1000 colony forming units/mL

**Water tests 72 hours after installation:**

Conductivity - 3200  
Calcium - 340 ppm  
Bacteria - 0 colony forming units/mL

Calcium and conductivity levels rose slightly showing that calcium was being removed from the surface of the equipment and dispersed into the water column. Additionally, the bacteria levels dropped to an undetectable level.

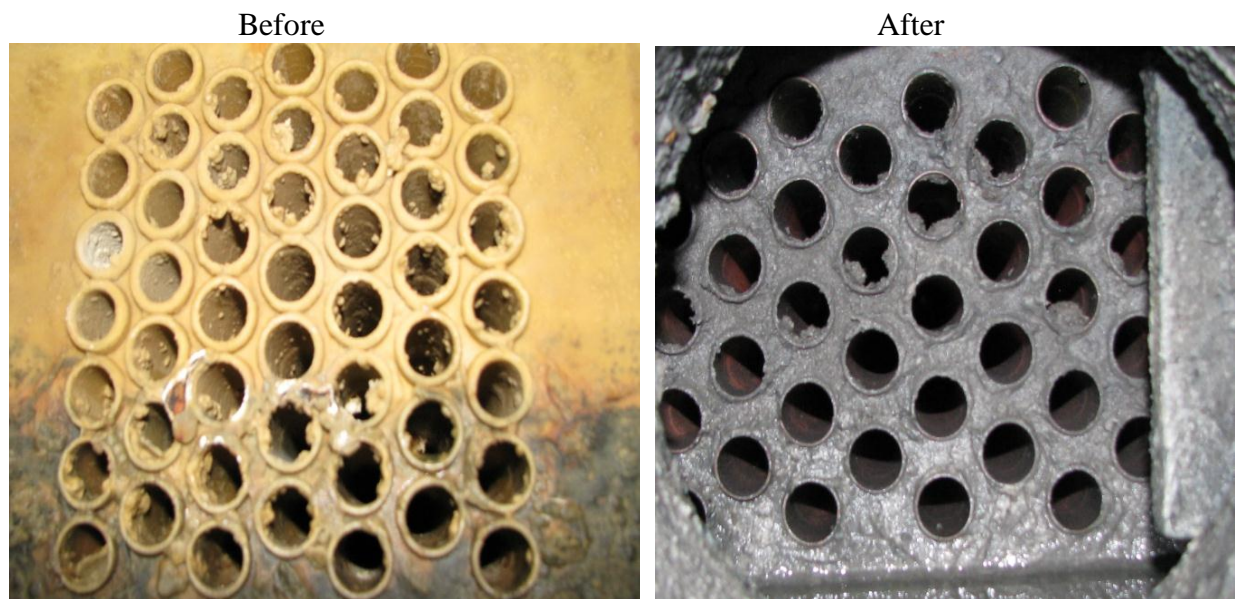
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**Three weeks after installation:**

The water softening equipment was disabled to let the P100 unit treat the system on its own. As time progressed, the conductivity readings consistently dropped allowing the “blow down” cycles to be lengthened to lessen the amount of water being flushed down the drain. Calcium levels were consistent around 150 - 200 ppm, algae and bacteria levels remained undetectable.

**Three months after installation:**

The absorption chiller was shutdown and the tube bundles were exposed to see the effects of the P100 unit.



Most of the calcium appears to have been removed from the tube sheet and a protective dark gray layer of magnetite is beginning to form

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Before



After



Heavy corrosion has been removed from steel and a protective dark gray layer of magnetite is beginning to form

Before



After



All white colored calcium deposits have been removed from interior of the 4" pipe.

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## Summary:

In the past the tubes would have to be cleaned twice a cooling season if the water softening equipment failed or was inoperable. It appears that the P100 system is having a positive impact on the water quality issue, removing not only calcium and corrosion but also prohibiting the ability for bacteria to grow in the water column.

The estimated projected savings for this piece of equipment per cooling season (7 months) is **\$3,500.00** in salt, **\$500** in chemical cleaning materials and **155,000 gallons (\$250)** of water between backwashing softening equipment and blowing down due to total dissolved solids in the water column.

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