



Final Monitoring Report

Fine Foods- Eastern Bakery

Weekly Monitoring for Eastern Bakery Dishwasher
Unit

Feb. 21- April 10, 2016



Overview

- Installation demo of ScaleWatcher 5 Star model was on Feb. 21, 2016. (50th day mark as of today- April 10, 2016)
- Weekly progress monitoring is taking pictures of almost similar angles and by checking the status of scaling in the dishwasher.
- No chemicals is to be used for the dishwasher for scaling concerns.
- Continue the usage of detergents then monitor if there is any usage reduction.



Problems Associated with Hard & Soft Water

- Scaling
- Corrosion
- Biofilm
- Unstable pH condition
- High Cost of Maintenance

-Waste of time, money, energy & significant increase of water usage



Problems associated with Hard Water

Scaling



Scaling on water heater



Scaling on the nozzles



Problems associated with Hard Water

Corrosion



A natural process, which converts a metal to a more stable form, such as its oxide or hydroxide.



Problems associated with Hard Water

Biofilm

Communities of bacteria that grow on nearly any surface



Problems associated with Hard Water

Unstable pH conditions



<http://f.tqn.com/y/chemistry/1/S/Z/P/2/137357467.jpg>



Problems caused by minerals in water

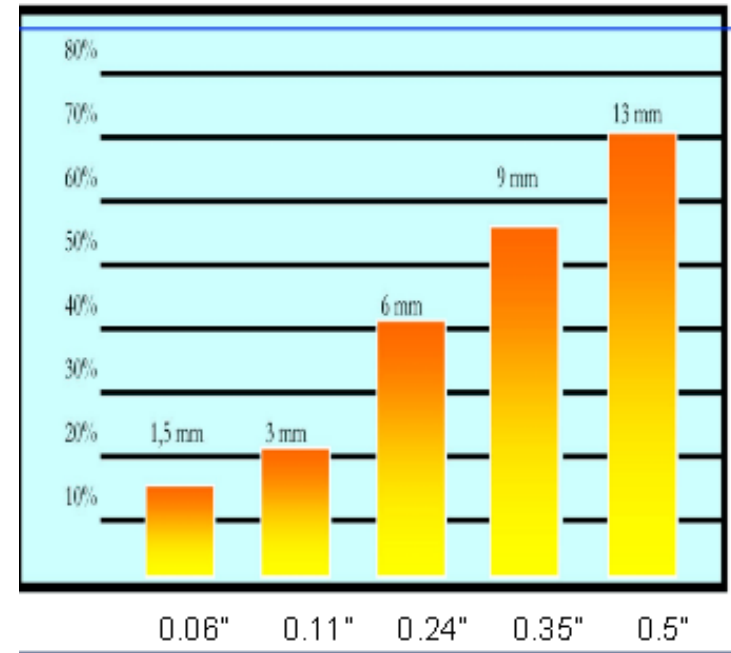
Adverse effect of mineral scaling:

- Pressure in pipe lines Pressure increases, therefore pumps have to work harder and consume more energy
- Heat transfer. A 10 % increase in energy demand is caused by a 1 mm scale thickness on the heating surface to achieve the same temperature as without scaling.
- Bacteria/Biofilm/Algae. Calcium layers and algae growth are a breeding ground for bacteria.
- Corrosion.

The treatment has a positive effect on the above mentioned adverse effects by influencing crystal growth in the water. Old hard layers will be gradually softened and carried away by the flow of water.

The cost of scale build-up

Percentage increase in fuel costs due to scale build-up in an average water system.



Actual Progress Documentation

February 28, 2016



March 05, 2016



Actual Progress Documentation

February 28, 2016



March 05, 2016



Actual Progress Documentation

February 28, 2016



March 05, 2016

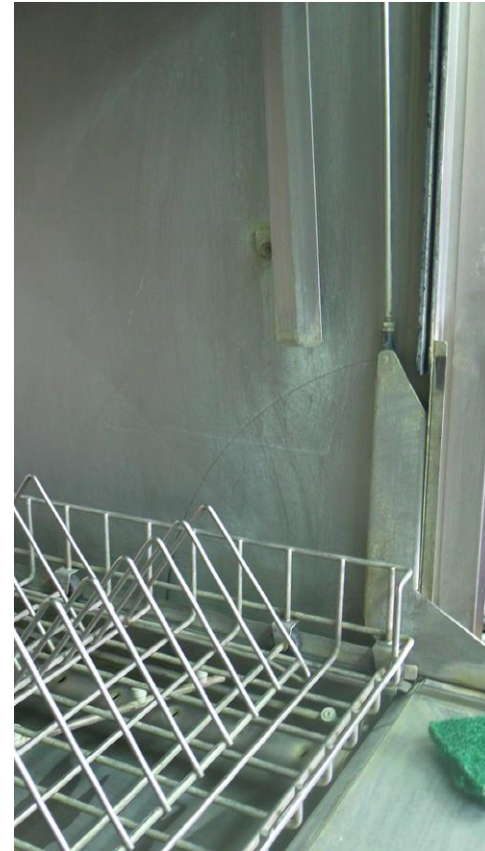


Actual Progress Documentation

February 28, 2016



March 05, 2016



March 12, 2016



March 19, 2016



Left Side Angle- 1 Month After

Feb . 28, 2016



March 30, 2016



Actual Progress Documentation

February 28, 2016



March 05, 2016



Center Portion of the Dishwasher

March 12, 2016



March 19, 2016



1 month descaling monitoring

Feb. 28, 2016



March 30, 2016



Right Side Angle

Feb. 28, 2016



March 12, 2016



Right Side Angle- 1 Month After

Feb. 28, 2016



March 30, 2016



Observations:

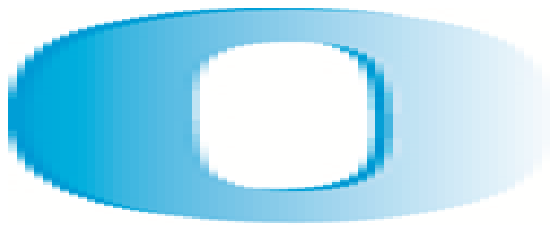
- Hard scaling in the dishwasher has gradually softened.
- The cement-like hardness of opaque white scaling has turned to slightly yellowish then yellowish scale as a sign of softening as noted weekly.
- Scaling can be removed slightly with the use of the fingernails; more with sponge and steel wool which was also noticed by the crew assigned in the dishwasher as well as Mr. Ismael.
- Dull metal appearance has slightly improved on a weekly basis and then after more than a month it became more shiny and polished in appearance.
- Scaling as a potential source of contamination has been significantly reduced.



Recommendations:

- Continue the non usage of chemicals for the dishwasher's scaling.
- Monitor the softening of scale and try from time to time scrubbing it with sponge or steel wool.
- Monitor the detergent usage if volume has decreased.
- Continuous treatment of the water in order to totally eliminate the existing scaling.
- Descaling in a natural way is a potential savings for the company by reducing power usage and expenses.
(3mm has an incremental increase of 20%; 6mm= 40%; 9mm= 60% and 13mm= 70%)





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