

Pentair quickly delivered a more efficient method of managing the restaurant's water softening program.

Once the cause of the mineral scale was identified, Pentair worked with the restaurant to quickly install the Everpure CES9500M-68 Series Twin Tank Water Conditioner and the chain was able to resume the dish machine test.

A follow-up interview with the restaurant manager revealed a further benefit: cleaner water and a cleaner restaurant. "Ever since Pentair put in their water softener, we are finding it easier to keep our restaurant clean. The water seems cleaner and our chemicals definitely work better than before," the manager noted.

Pentair's solutions, including site surveys, water testing and analysis, defined product solution and technical support, delivered benefits beyond the chain's initial goals. Working with Pentair Everpure resulted in:

- Reduced water usage and costs
- Reduced salt costs and less salt being discharged into the environment
- Reduced energy usage
- Reduced equipment problems and maintenance costs related to mineral scale
- Cleaner water and restaurant environment

To learn more about how Pentair has helped businesses around the world with innovative water treatment and fluid delivery solutions, and how we can help your business, please contact Pentair Foodservice at 800-942-1153 or sustainable_solutions@pentair.com.

About Everpure

Everpure, a leading foodservice industry supplier, has been manufacturing commercial water treatment products, solutions and services worldwide since 1933. Everpure is also a trusted provider of water treatment products to the vending, consumer, marine and aviation markets. Industry leaders around the world rely on Everpure for quality water treatment. Everpure is part of the Process Technologies division of Pentair, Inc. (NYSE: PNR). For more information on Everpure, visit our website at www.everpure.com.

About Pentair

Pentair (www.pentair.com) is a global diversified industrial company headquartered in Minneapolis, Minnesota. Its Water Group is a global leader in providing innovative products and systems used worldwide in the movement, treatment, storage and enjoyment of water. With 2011 revenues of \$3.5 billion, Pentair employs over 14,000 people worldwide.

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Leading QSR chain saves at least 25% on water, salt and energy consumption at LEED® Certified locations.

A leading Quick Service Restaurant (QSR) chain began testing a new dishwashing machine in one of its locations to identify potential labor cost savings. However, mineral scale began to build up inside the machine, compromising the test. Pentair's® Everpure® brand developed a water treatment solution that not only eliminated mineral scale, but also allowed the restaurant to reduce its water, salt and energy use by 25% versus a competing solution.

The dishwashing process in a kitchen often presents many opportunities to reduce water usage, energy costs and labor costs. Adding a dish machine or upgrading an old unit to an ENERGY STAR® certified machine can help. To conduct a thorough cost/benefit analysis, however, you need to consider the volume and frequency of dishes typically washed, the level of maintenance required, and the cost of chemicals needed to run the machine. One key factor that is often overlooked is the quality of the water being fed to the hot water booster and the dishwasher. Is there a water softener on site to prevent limescale accumulation in the equipment? Is there a schedule in place to replenish the salt in the softening system's brine tank?

A major QSR chain saw an opportunity to save labor costs by testing a new dishwashing machine in place of a manual dishwashing process at one of its restaurants. If the dish machine test delivered significant savings, the chain planned to install machines in multiple locations. But after just a few weeks of operation, mineral scale began to build up in the dish machine, threatening the test as well as the operational performance of the machine.

Mineral scale occurs when energy is applied to water that contains:

- **Hard minerals.** This is typically calcium and magnesium that becomes dissolved in water. Rain, which is acidic in nature due to carbon dioxide in the atmosphere, dissolves limestone as it percolates down through soil

to underground aquifers. Dissolved hard minerals, under the right conditions, will return to its original rock form over time.

- **Alkalinity.** Water is either acidic, neutral or alkaline as measured on a pH scale of 0-14, with 7 being neutral. Water that is less than 7 is acidic while water that is greater than 7 is alkaline. Acidic water keeps minerals apart, alkaline water brings minerals together. The higher the alkalinity, the greater likelihood that scale conditions will exist.
- **Dirt.** Water naturally contains silt and sediment which provide something for the dissolved minerals to cling to as they fall out of solution (much like water collects on dust particles to create a rain drop).

Water in a commercial dish machine is heated to 180°F or greater in order to properly sanitize, a process which promotes the formation of a very hard scale "crust" inside the equipment. This coating forms on its surfaces, heating elements, in spray nozzles and even on dishes. Scale can result in:

- **Higher energy costs.** Scale acts as an insulator, which means that more energy is required to bring water up to temperature. Just ¼" of scale can increase energy consumption by 38%.
- **Higher maintenance costs.** Mineral scale is typically removed using a deliming process that utilizes harsh, acid-based chemicals. This can take 2-3 hours or more in labor and the chemicals used in the deliming process will sometimes cause corrosion in the equipment.
- **Equipment downtime.** Scale can cause heating elements to break, solenoids to malfunction and orifices to plug. Stress cracking can also occur in the hot water boost system, resulting in leaks.
- **Spotting.** Minerals can leave unsightly spots on dishes and glassware used by restaurant patrons.



Eliminating water scale while meeting water conservation goals.

The site chosen for the QSR's dish machine test was a facility designed to meet the U.S. Green Building Council's LEED® certification criteria. LEED (Leadership in Energy and Environmental Design) is a rating system that awards points and incentives for buildings that achieve specific green building goals in categories such as water efficiency, sustainability, energy, indoor environmental quality, materials, innovation and design. While the primary objective of the dish machine test was to determine potential labor savings, its energy and water requirements were also being evaluated.

Pentair water analysis revealed water quality issues – and led to the solution.

Before the QSR chain installed the dishwashing machine and encountered the mineral scale build up challenges, Pentair conducted eight site surveys as part of the discovery portion of its Total Water Management (TWM) process. These site surveys identified unique opportunities to improve each of the chain's specified locations with customized solutions as well as to match the appropriate Pentair products and services to each restaurant's needs. Pentair then delivered a detailed report establishing a baseline to measure quality improvements, cost containment and overall efficiencies of its recommended water softening program.

As the mineral scale problem occurred, the QSR chain sought solutions from potential water treatment suppliers, including the supplier of the dishwashing machine. After a careful review of those options, the chain selected Pentair Everpure as the solution provider because of its strong expertise in water, its broad range of solutions, and the QSR's previous positive experience in working with Pentair.

Pentair's analysis of the restaurant water quality showed high levels of calcium and magnesium (i.e. hardness). A competitor had recommended a single tank water softener solution, but Pentair knew how important it was for this LEED-certified restaurant to conserve valuable water as well as solve the mineral scale problem. Pentair determined that a twin tank (duplex) water softening system would address the hardness problem AND save at least 25% on water, salt and energy consumption versus conventional commercial water softening alternatives.

Pentair duplex, metered water softening system saves salt, water, energy.

Softening, also called ion exchange, is a process where negatively-charged resin beads attract positively-charged calcium ions. Eventually, the resin reaches its maximum capacity to retain the calcium ions. Regeneration is the process by which resin is rinsed with brine (salt) solution which then washes the collected calcium ions off the resin and down the drain. The resin is now ready to capture the calcium ions again. This process is repeated on a schedule set by either a time clock or an electronic meter.

Most restaurants utilize single tank water softeners which use time clock controls to produce softened water. Systems with such controls require a 25% reserve because when a softener is regenerating, it's not producing soft water. The reserve ensures that if the restaurant uses more water than expected, it will not run out of soft water before the unit is set to regenerate.

The Everpure CES9500M-68 Series Twin Tank Water Conditioner from Pentair was the alternate solution the chain needed to avoid those single tank system limitations. This metered, twin tank – or “duplex” – unit does not require any reserve. When one tank is fully used and needs to regenerate, the unit automatically switches to the other tank for soft water delivery. The system continuously produces softened water and eliminates regeneration “downtime”.

Time Clock Units:

- Require a 25% reserve
- Use more salt than metered units
- Use more water than metered units
- Experience more wear and tear than metered units
- Require more service calls than metered units

Metered Units:

- Need no reserve
- Use less salt than time clock units
- Use less water than time clock units
- Offer a longer life expectancy than time clock units
- Require fewer service calls than time clock units



Total water and salt savings

Pentair's TWM approach provided the QSR chain with real-world data that helped the chain to select a water softening solution with the lowest total Life Cycle Operating Cost (LCOC).

The following savings scenario reflects a proven LCOC case study when an Everpure Alternating Twin Tank Softener replaced a traditional, time clock-based, single tank softener in a typical QSR restaurant setting.

Long-Term Savings: \$23,181.72

On a weekly basis, the typical restaurant's current softeners were using an average of 315 lbs. of softener salt at a cost of about \$53.00, and using 1,092 gallons of water at a cost of about \$7.70. Annual costs reached over \$2,700.00 in salt and over \$400.00 in water. Pentair's duplex softening solution would save over \$2,000 per year in softener salt compared to the restaurant's current softeners. The Pentair system would also save 414 gallons of water annually for a water cost savings of \$152.00.

Over 10 years, the restaurant would save \$20,685.60 in salt and nearly \$2,500 in water costs for total long-term savings of just over \$23,000.

