

Calcium Fouling Problems and a New Solution

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Calcium fouling is a multi-billion dollar problem in the United States. It affects every business and industry that uses water for any purpose. Downtime and high maintenance costs are the hallmarks of calcium fouling. In time, calcium forms deposits in every plumbing system and appliance. If the water is heated, cooled, or changes pressure, these deposits occur much faster. Crystals of hard calcium then bind to each other and build up on almost any surface. Kitchen appliances are some of the best collectors of calcium deposits.



Calcium is also a thermal insulator. It inhibits the flame of a water heater from heating the water inside the tank. This is why water heaters will most often leak at the bottom when they fail. When heated, the calcium and steel “sandwich” causes fatigue at the bottom of the steel tank.

In an electrical heating element, calcium builds up on the outside of the element and traps heat. The element is then forced to work at a much higher temperature than its design parameters. It then fails long before its time. In some areas, heating elements in coffee makers build an inch of scale in just a few months.

Temperature sensors with calcium deposits add to the problem. The sensor is thermally insulated from the water, masking the actual water temperature. This causes the control system to demand more heat from the element. In addition many sensors have their own heating element built in. Calcium deposits causes these elements to fail prematurely due to trapped heat.

Calcium deposits are also a major factor in corrosion. The corrosive contaminants become trapped by the calcium and allow them to dissolve pipes, tanks, valves and water jackets of kitchen appliances. This corrosion reduces the life expectancy of all appliances that use water.

Energy costs for calcium deposits are a major factor to consider. Studies of water heaters indicate that ¼ inch of scale can increase fuel consumption by as much as 40%. In cases where the scale builds up to 1 inch, there is a 95% reduction in heat transfer. In commercial water heaters the cost of operation will often exceed the cost of the unit itself.

Historically, hard water has been treated by salt-based systems that work on a principal called ion exchange. A portion of the calcium ions is exchanged for sodium ions. The problem is that this process is not complete. A new salt-based system typically removes

about 75% of the calcium from the water. An older unit will often perform at less than 40%. In any case the balance of calcium will make its way into the plumbing system and form hard deposits. This often requires the use of acid de-scaling agents to attempt to keep these deposits in check.

Until recently, water treatment by electronic or magnetic methods has been inconsistent. Magnets are only marginally effective. This is because a flow rate of 2.3 meters per second is required for optimal results. If the water flows at any other rate (faster or slower) the affects are significantly reduced. In the past, results from units that create magnetic fields electronically have also proven unreliable. The problems have typically been low output power and limited frequency range.

The Soo~Soft unit is unique in its operation and results. It is 100% effective in every water condition. It does not remove calcium, but it converts the calcium carbonate into a soft form called calcium aragonite. This form has a particle size that is about 4 microns. It has the constancy of talcum powder and produces water that is a much better solvent. The Soo~Soft unit also changes the electrical charge of the water, preventing the particles of calcium from sticking to surfaces. This treated water then dissolves the existing calcium deposits in everything through which it flows through in 90 days.

Its very small size prevents it from reverting to a hard (carbonate) form until the water is heated to over 700 degrees. This is well out of the range of any kitchen appliance including steam ovens. A 2-inch Soo~Soft commercial unit can process over 150 gallons of water per minute. The output of the 2-inch unit is over 6000 milliamps of power into the coil. As it is the most powerful unit on the market, it is both reliable and consistent.

The affects “downstream” of the Soo~Soft unit are profound. After an initial 90-day period of de-scaling, ice machines, coffee makers, steam tables, steam ovens and other appliances no longer clog with deposits. The grief of calcium deposits in equipment is over. Lime scale no longer forms in sinks, toilets, and bathtubs. The effectiveness of soaps, detergents and other chemical agents used for cleaning increases as much as 60%. Housekeeping labor is then reduced with the absence of lime scale deposits.