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The environmental benefits of soft water

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(ARA) - When you think of soft water, the first thing that probably comes to mind is lustrous, easy-to-manage hair. Another benefit is washing clothes in soft water leaves them softer and saves a significant amount of detergent. Best of all, when cleaning, you don't get that ugly bathtub ring.

By eliminating hard water minerals, you can see health and cosmetic benefits, as well as reduce the maintenance costs associated with scale buildup in home plumbing.

The water softening process is actually quite simple. Hard water is passed through a bed of negatively charged ion exchange resin beads which absorb and bind positively charged hardness ions. The beads initially contain sodium ions, which swap over with the hard calcium and magnesium ions. The "harder" the water, the more sodium ions are required to soften it. As the resin beads become loaded with hardness ions, they lose their effectiveness and must be regenerated - a process that is accomplished by passing a sodium chloride solution through them so that they return to their original state. Modern water softeners have control devices to minimize the amount of waste water during regeneration.

Regeneration waste water has come under environmental criticism even though it has not been proven to be a problem under most conditions. In response to these concerns, the Water Quality Association contracted the prestigious Battelle Institute to look at whether ion exchange water softening is an eco-friendly technology able to provide a reduced carbon footprint in homes by significantly increasing the efficiency of home heating technologies.

Scientific testing focused on the impact of soft water on the life and energy use of appliances commonly used in U.S. homes, including all types of water heaters, washing machines and dishwashers as well as plumbing fixtures such as showerheads and faucets.

The results of the studies showed that with softened water, all water heaters maintained 100 percent efficiency over a simulated 15-year lifetime, but with hard water, the gas and electric heater efficiency dropped by 25 percent - an incredible loss in energy utilization. In the case of the new instant tank less water heaters, on hard water they completely failed to function because of plugged-up scale or mineral build-up associated with hard water, after only 1.6 years of simulated use - about a tenth the normal life of the appliance. In addition, soft water saved between 40 to 57 percent of energy costs compared to tank less heaters running on hard water.

When tested on showerheads and faucets, soft water maintained a high polish on the finish and a full water flow. With hard water, showerheads scaled up and lost 75 percent of their flow rate in less than 18 simulated

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months and could not maintain the required flow rate because of scaling, which completely plugged the strainers after 19 days of testing.
Soft water also has been studied for its health aspects. One report from the Proceedings of the National Academy of Sciences, titled "Opportunistic pathogens enriched in showerhead bio films," describes the potential for scaled-up showerheads to harbor pathogenic microorganisms that cause pulmonary problems.

Without scale buildup, these microorganisms do not have a chance to anchor in and grow - they simply get washed away. "We conclude that showerheads may present a significant potential exposure to aerosolized microbes, including documented opportunistic pathogens. The health risk associated with showerhead microbiota needs investigation in persons with compromised immune or pulmonary systems," concluded the report.

The net results of the Battelle study show that by maintaining a high level of efficiency, home water heaters, faucets, showerheads and various appliances will use significantly less energy, resulting in a dramatically decreased carbon footprint with soft water. Appliances will last longer, contributing to less waste and improved health by eliminating scaled surfaces that could harbor pathogenic bacteria.

Courtesy of ARAcontent