

Water Softeners



Optional Water Efficiency Measure: May contribute to the 30 percent water efficiency requirement, depending on the chosen WaterSense® Approved Certification Method (WACM).



UNDERSTAND

- Water softeners are common household appliances found in regions where hard water (or water that contains higher amounts of dissolved calcium or magnesium) is prevalent. Hard water can cause scale to form on the inside of pipes, water heaters, and other appliances and equipment. Scale does not conduct heat well and can reduce the flow of water through pipes and fixtures. Hard water also reacts with soap to form a sticky coating on skin and reduces soap's ability to lather, which can make a bath, shower, or clothes washer cycle less productive.
- Cation exchange water softeners remove the calcium and magnesium ions found in hard water by exchanging them with sodium (or potassium) ions in salts that include chloride. Once all the ions are fully exchanged, the water softener undergoes a regeneration process to flush the system of excess ions so that the system is again ready to soften incoming hard water.
- Water softeners are not necessary in all homes. They should only be considered in areas of substantial hardness or where recommended by appliance manufacturers, local health and safety codes, and/or water utilities. Some jurisdictions may limit the use of water softeners or have requirements that must be met to minimize water waste or preserve water quality.
- The NSF/ANSI 44 *Residential Cation Exchange Water Softeners* standard includes a voluntary efficiency rating that requires softeners to use 5.0 gallons of water or less per 1,000 grains of hardness removed.
- Water softeners that use demand-initiated regeneration are more efficient than water softeners that function based on a fixed schedule.

Not Just Water Efficiency

When selecting a water softener to install in a home, it's best to consider not just water efficiency, but salt efficiency too. Salt efficiency defines the hardness removal capacity of a water softener and is measured in grains of hardness removed per pound of salt.

Salt efficiency is important for two reasons. First, greater salt efficiency reduces the amount of salt that needs to be purchased and supplied to the unit by the homeowner. Second, it decreases the amount of sodium and chloride ions that are discharged into the home's wastewater. Too great a concentration of these ions can negatively impact septic systems or affect the ability for the community to meet water quality discharge limits for sodium and chloride or reuse municipally treated wastewater.





BUILD

- **AVOID** installing water softeners when water hardness levels do not indicate a need for softening.
- **SPECIFY** demand-initiated regeneration systems that meet the voluntary efficiency rating requirements of NSF/ANSI 44. Select models with a lower water consumption (i.e., gallons per 1,000 grains of hardness removed) and higher salt efficiency (i.e., grains of hardness exchanged per pound of salt).
- **CONSIDER** supplying softened water only to a subset of fixtures or household uses. For example, consider plumbing the system to only soften hot water. Likewise, outdoor water use, for example, may not require softened water. Reducing the demand on a water softener will result in lower water consumption and operating costs.



VERIFY

- **OBTAIN** the make and model number for all water softeners.
- **REVIEW** the manufacturer's product specification sheet or product literature to determine water efficiency and salt efficiency.

**NOTE: Consult with the Home Certification Organization for specific verification protocols.*

Alternatives to Water Softeners

Technologies have been developed that provide alternatives to traditional cation exchange treatment. Evidence suggests that some of these devices can provide anti-scaling treatment without the use of salt and reduce water consumption from flushing the system. The links below provide information on some of the alternatives.

- University of Nebraska Extension Fact Sheet: <https://water.unl.edu/article/drinking-water-wells/salt-free-water-softener-alternatives>
- City of Waterloo, Ontario, Information on Softener Alternatives: <https://watersoftenerfacts.ca/how-softeners-work/#alternate>

IAPMO/ANSI Z601 *Standards for Scale Reduction Devices* was developed to evaluate whether softening devices or other treatment devices effectively reduce scale. More information about the standard can be found at www.wqpmag.com/services/product-testing-certification/article/10958980/testing-for-scale.

Learn More

Visit WaterSense's Cation Exchange Water Softeners web page at www.epa.gov/watersense/cation-exchange-water-softeners for more information.

