

TOP 4 METHODS OF WATER SOFTENING & HOW THEY WORK

SALT-FREE WATER SOFTENERS (CATALYTIC MEDIA)

About Salt-Free Water Softeners

The NaturSoft media has calcium carbonate crystal structures on its surface that will attract excess dissolved hardness and remove it from solution by integrating it into the crystal structures on the media. This results in the crystals on the media surface to grow larger. The movement of water and friction among the individual media granules rubbing against each other will cause fragments of these newly grown crystal structures to be fragmented off the media and released into the passing water. Those free flowing calcium carbonate crystals then continue to travel through a plumbing system as suspended particles where they perform the same role as the media in the NaturSoft system itself, i.e. acting as seed crystals further buffering the effects of any changes in the scale potential of the water downstream by absorbing excess mineral into their structure and themselves spawning the creation of additional micro crystals.

Advantages

The system requires no monthly maintenance or additional monthly costs. It softens the water without the use of salt or potassium, therefore there is no need for an expensive reverse osmosis system for drinking water. The salt free softener leaves in all the essential minerals for the drinking water requiring no chemicals, electricity, or back flushing to operate. There is no wasted water or drains to install. It allows for up to 50% less soaps or detergents to be used, saving money and completely removes and prevents 100% of the scale from forming in all pipes and heat exchangers (hot water heater). The system does not fall under any softener ban because it does not discharge salt or potassium back into the ground water. It is 100% environmentally friendly. Longer life of appliances including washing machines, dishwashers, and water heaters; less use of household cleaning products, such as detergents, as well as personal care products, like shampoo; reduction of water spotting; cleaner, softer feeling clothes.

Disadvantages

Not recommended for water that contains traces of oil, or H₂S.

SALT-BASED WATER SOFTENERS (ION EXCHANGE)

About Salt Water Softeners

Calcium (Ca²⁺) and magnesium (Mg²⁺) ions that cause water hardness can be removed by using an ion exchange procedure. Water softeners are cation exchange devices. Cations refer to positively charged ions. Cation exchange involves the replacement of the hardness ion with a non-hardness ion. Salt-based water softeners use sodium (Na⁺) as the exchange ion. Sodium ions are supplied from dissolved sodium chloride salt, also called brine. In the ion exchange process, sodium ions are used to coat an exchange medium in the softener. The exchange medium can be natural zeolites or synthetic resin beads that resemble wet sand. As hard water passes through a softener, the calcium and magnesium trade places with sodium ions. Sodium ions are held loosely and are easily replaced by calcium and magnesium ions. During this process free sodium ions are released to the water. After softening a large quantity of hard water the exchange medium becomes coated with calcium and magnesium ions. When this occurs, the exchange medium must be recharged or regenerated. To recharge the softener with sodium ions, a softener is back flushed with a salt brine solution. During a back flush the brine solution replaces the calcium and magnesium ions on the exchange medium with sodium ions from the salt solution. The time between recharging cycles depends on the hardness of the water, the amount of water used, the size of the unit, and the capacity of the exchange media to remove hardness.

Advantages

Longer life of appliances including washing machines, dishwashers, and water heaters; less use of household cleaning products, such as detergents, as well as personal care products, like shampoo; reduction of water spotting; cleaner, softer feeling clothes.

Disadvantages

Softened water from a salt-based water softener is not recommended for drinking, watering houseplants, lawns and gardens due to its sodium content. There are many health risks associated with sodium intake. During the softening process sodium is released from the exchange media into the output water. For every grain of hardness removed from water, 8mg/1 (ppm) of sodium is added. People on restricted sodium intake diets should account for increased levels of sodium in softened water. Your family physician should be consulted. Sodium intake from softened water can be avoided by leaving one kitchen tap un-softened from drinking and cooking. Water used in recharging a water softener may over load or reduce the effectiveness of small septic or sewer systems. Softened water is not recommended for small appliances such as steam irons or evaporative coolers. There are additional cost and maintenance required. Salt-based softeners require that salt be added to the system on a regular basis based upon the hardness of the water. Cost of salt is approximately \$5 to \$7 per 40-pound bag depending on the form

REVERSE OSMOSIS (ULTRA FINE FILTRATION UNDER PRESSURE)

About Reverse Osmosis

Reverse osmosis is used to remove dissolved impurities from water through the use of a semi permeable membrane. Reverse osmosis involves the reversal of flow through a membrane from a high salinity, or concentrated, solution to the high purity, or permeate, stream on the opposite side of the membrane. Pressure is used as the driving force for the separation. The applied pressure must be in excess of the osmotic pressure of the dissolved contaminants to allow flow across the membrane. For example, the membrane may allow passage of water molecules, but blocks molecules of dissolved salt. The membrane retains unwanted molecules while the ultra-pure water continues on for use or further treatment. This process takes any unwanted molecules retained by the membrane and sweeps them away to the drain.

Advantages

Ultra fine filtration at the molecular level filters out 98% of all unwanted molecules. Reverse osmosis removes salt, heavy metals, and most solids.

Disadvantages

Reverse osmosis strips the essential minerals from the water therefore it is not suitable for plants, animals, humans or cooking (according to the World Health Organization). Reverse osmosis water is hard on plumbing and fixtures, due to the non-mineral content in the water. Reverse osmosis only recovers between 5% and 15% of the water entering the system; the rest of the water is wasted. The system requires a connection to a drain for wastewater. The process is relatively slow and requires a storage tank. Low water pressure and high temperatures adversely affect the production of water. A booster pump may need to be installed for low-pressure situations. The storage unit for treated water will support bacteria growth unless regularly disinfected. Costly membranes will need to be replaced periodically.

MAGNETIC WATER SOFTENER / MAGNETIC WATER CONDITIONER(USES MAGNETS)

About Magnetic Water Softeners

The majority of these devices claim to work by causing the carbonate salts that would ordinarily form adherent scale deposits to precipitate as small particles within the water instead. This would also presumably reduce the concentration of the calcium and magnesium ions that react with soaps to form insoluble scum.

Advantages

Magnetic water softening claims to reduce the scale build up and the affects of hard water. The magnetic devises are very inexpensive compared to other methods of softening water.

Disadvantages

The degree of efficiency is constantly changing. The magnetic field exists only in the immediate vicinity of the device and therefore only affects behavior of water that has passed through the immediate vicinity of the device. The state of the water after it has been introduced to the magnetic field will only stay in that state for a period of 48 hours, which means if the water is not used for more than 48 hour it will revert back to hard water with the negative effects. The Tests conducted at Purdue University found "ō no significant, beneficial variation in the physical or chemical water quality parameters measured." Another disadvantage is that there is the possibility of experiencing interference from other high voltage cables in the surrounding area.Note: GMX magnetic systems were not tested by Purdue

Conclusion

The above methods of dealing with hard water are proven technologies if used in the right application. We recommend you consider on going maintenance cost as well as initial cost of each system. Please refer to the recommended usage section for a good starting point in your decision-making.

http://www.watersoftenerscompared.com/compare_water_softeners.html?source=google&gclid=COThwq-jgqsCFSBCgwodRnXLzA