

Water Softening and the Environment

The Effects of Water Softening and Salt Use on the Environment

The salt used by each homeowner's softener ultimately ends up in neighboring lakes, streams, rivers, and groundwater. Also, the salt spread on roads, driveways and sidewalks ends up in lakes, streams, rivers, and groundwater. The cumulative effects of the salt used can have toxic effects for aquatic plants and animals.

Why Is Salt A Problem?

Based on estimates from the Salt Institute of America, in 2005 Americans' spent approximately \$359 million to purchase 3.7 million tons of salt for use in water softeners.

The primary salt utilized in home water softeners is sodium chloride (NaCl), a naturally occurring and commonly used substance. NaCl normally breaks down into sodium (Na⁺) and chloride (Cl⁻). These elements are discharged to the local wastewater treatment plant via sanitary sewers. It passes through the treatment plant and is discharged to surface water, where the chloride may impact freshwater organisms and plants, from plankton to fish, by altering reproduction rates, increasing species mortality and changing the characteristics of the entire local ecosystem. In addition, as chloride filters down to the water table, it can stress plant respiration and change the desirability of our drinking water.

How does a Water Softener Work?

In many Wisconsin communities, people use water softeners to remove minerals from their water that cause hardness. An ion exchange process is the traditional method of removing hardness from water. Hard water passes through a column of sodium charged resin, where hard water ions such as calcium and magnesium are removed from the water by exchanging places with the resin bound sodium ions. The water is then said to be "softened".

The resin is "exhausted" when it has given up all or most of its available sodium ions. The resin is then "recharged" with sodium ions during a process known as regeneration. During this process, the resin is washed with a concentrated brine solution (most often NaCl) that reverses the hardness removal process.

What Can I Do to Reduce My Salt Usage?

If you find it necessary to soften your water, soften only the water that needs to be softened. If you are building a new house, remodeling bathrooms or kitchens, replace old plumbing or installing a new water softener, consider where your water needs to be softened. Work with your plumber to connect your water softener to only those areas that need softened water.

Places to "Feed" softened water are:

- Hot water heater
- Laundry facilities
- Dishwashers
- Toilets (consider low flush models)
- Showers

Places to Bypass Using the Water Softener Include:

- Outside water spigots for yard use
- Cold tap drinking water lines

By softening more water than what is really needed, you increase the cost of operating your softener (in terms in increased payments for salt and energy), and ultimately, more salt will enter the environment as a result of increased softener regenerations.

Use minimum salt usage needed for regeneration - Water softener regeneration is most efficient at the beginning of the brine cycle. The higher the salt dosage in the cycle, the lower the regeneration efficiency.

By setting your water softener to regenerate more frequently and using less salt for each regeneration, you may be able to increase your softener's regeneration efficiency, which could result in significant salt savings for you.

Consult a qualified water softener representative for details on how to adjust your water softener to minimize salt usage while retaining enough softened water for normal household use.

Switching from a Timer to a Demand Initiated Regeneration Control -

Many water softeners regenerate based on a timer typically set to regenerate once every 2 or 3 days, depending on expected water usage and water hardness. By measuring actual demand on the water softener, "demand initiated regeneration", or DIR controls are much more efficient in the regeneration process. These controls use either, a flow meter or a hardness sensor to determine when to begin the cycle. The "payback" period for adding a DIR control to your water softener from reduced salt usage can be as little as three years. Check with your local qualified water softening representative to see what is appropriate for your particular needs. Even if a newer, more efficient water softener is not in your immediate future, you can still optimize the efficiency of your home unit, resulting in savings for you and the environment.

Installing low flow shower heads, low flush toilets, and only watering your lawn in the evening help to reduce the volume of water softened.

Also, use salt on sidewalks and driveways wisely. Carefully spread the salt on your driveway and walks so it does not overshoot the intended area. Also, use only the amount of salt that is required to melt the ice and snow.

To reduce or eliminate NaCl, our best alternative is preventing the pollution at the source of its generation - before it creates a more serious environmental problem. Please do your part.

An Environmental Awareness Message
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