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HARD WATER CAN BE A NUISANCE

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Most of Alabama's water supply is not excessively hard. However, surveys indicate that water hardness is ranked as one of the most frequently occurring water quality concerns of Alabama citizens on private wells.

What Are The Problems With Hard Water?

Hardness minerals in water have a wide impact on households. Hard water interferes with almost every cleaning task from laundering and dish-washing to bathing and personal grooming. Clothes laundered in hard water may look dingy and feel harsh and scratchy. Dishes and glasses may be spotted when dry. Hard water may cause a film on glass shower doors, shower walls and bathtubs. Hair washed in hard water may feel sticky and look dull. When true soaps are used in hard water they combine with hardness minerals to form "soap curds" or "soap scum." Hard water is not the concern it once was because most detergents now include water softening chemicals in their formula.

Cooking with hard water can also cause nuisance problems. Hard water can produce scale on pots. Some vegetables cooked in hard water lose color and flavor. Home economists have reported that beans and peas may become tough and shriveled when cooked in excessively hard water.

Hard water also may affect the performance of household appliances. When hard water is heated, a hard scale is formed that can plug pipes and coat heating elements. Scale is a poor heat conductor. With increased deposits on the heating unit, heat is not transmitted to the water fast enough and overheating of the metal causes failure. Build-up of deposits will also reduce the efficiency of the heating unit, increasing the cost of fuel.

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Causes Of Water Hardness

Hard water is caused by rainwater dissolving calcium and magnesium as it passes through soil and rock formations. Other minerals, such as iron, may also contribute to water hardness.

Hardness is generally defined as the amount of calcium and magnesium in water expressed in terms of calcium carbonate equivalent. Water hardness is reported in one of two ways: either as milligrams per liter (essentially the same as parts per million) or as grains per gallon.

One common system of classifying the degree of water hardness appears in the following table.

Water Hardness	Grains per Gallon	Parts per Million (ppm)
Soft	0 to 3.5	0 to 60
Moderate	3.6 to 7.0	61 to 120
Hard	7.1 to 10.5	121 to 180
Very Hard	more than 10.5	more than 180

Treatment

There is no well-defined maximum allowable amount of hardness minerals in water. What may be suitable for one purpose such as drinking water may be unsuitable for another use. However, at 30 grains per gallon (about 500 ppm), water is so hard that it has an objectionable taste and may have a laxative effect if the hardness is magnesium sulfate. At that level, soap consumption is very high and pipe and water heater scaling is severe. Treatment is not recommended unless hardness exceeds at least 3 grains per gallon, which is 51 parts per million. (One grain per gallon equals 17 parts per million.)

Small amounts of dissolved minerals cause no problems and actually improve the taste of water. These minerals also coat pipes and fixtures to help insulate them from corrosion. Mineral-free water can cause rapid corrosion of pipes and fixtures even though the pH may be neutral. To reduce corrosion, many water utilities now add calcium salts to their finished water to raise pH and hardness.

You can reduce water hardness by using a mechanical water softening tank connected to your water supply line. Essentially all home water softening equipment now on the market operates on the ion exchange principle to remove hardness minerals from water.

Things To Consider

Should everyone use softened water?

Because of the high sodium content of softened water, individuals who have heart or circulatory problems or who are on low-sodium diets may be advised not to install water softeners. Persons with heart or circulatory problems should discuss the question with a physician. If water softening equipment is installed, a source of drinking water that is not softened may be advisable.

In addition to sodium, are there any other ways in which softened water may affect health?

Water contains trace elements of vital minerals found only in minute quantities in the human body. These tiny amounts may have a profound effect on human health. Water softening can remove these elements. Some researchers believe that the mineral content of water is directly related to cardiovascular disease. Studies have shown that risk is lowest where drinking water contains lots of minerals, and highest where the water is soft. If water softeners are used, consumers may want to consider installing a bypass to the kitchen water supply for cooking and drinking purposes.

Is softened water harmful to plants, lawns, and gardens?

Softened water is not ideal for continuous watering of plants, lawns, and gardens due to its sodium content. It is best to mix soft water with hard water when it is being used for irrigation. Care must be taken however, that water used in recharging a water softener is disposed of through a storm drain or sewer due to its damaging effects.

Should softened water be used in a steam iron?

The best water for steam irons is distilled water, particularly for use over a long period of time. Softened water is not free of minerals which may clog steam irons.

Should softened water be used in operating an evaporative cooler

The sodium in softened water will accumulate on evaporative cooler pads. The pads should be cleaned monthly by hosing them with hard water to remove the sodium buildup. Softened water may also be harmful to metal parts in coolers by causing excessive accumulation of rust. Bypassing the cooler with a separate water line for hard water is possible, but installation and maintenance costs must be considered.

Conclusion

Hardness is beneficial for drinking water. Hard water is usually higher in alkalinity and less corrosive to plumbing than soft water. Soft water with a pH below 6.5 may be very corrosive and leach lead from brass fixtures in plumbing systems. Blue or greenish staining in sinks is a definite warning sign.

On the other hand, the advantages of softened water are numerous. You can expect cleaner, softer-feeling clothes, less use of household cleaning products such as detergents, less use of personal cleanliness products, such as shampoo, and all around easier maintenance and upkeep of the home. You can also expect longer life of appliances that use water, including washing machines, dishwashers, and water heaters.

But whether to soften household water supplies or not is not a decision to be made lightly. Among factors to consider are family composition, stage in the family life cycle, lifestyle, health, maintenance of equipment and cost.