



ADVANCED WATER SYSTEMS GROUP

Proudly Presents

Frequently Asked Questions (FAQs) About Residential Water Quality

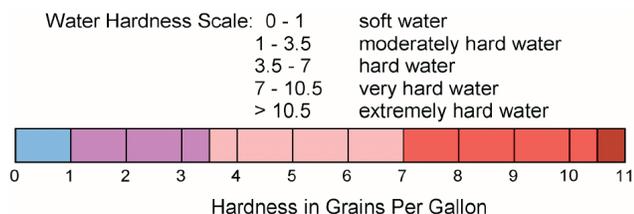
What is Hard Water?

“Hard” water refers to water containing certain dissolved minerals. Whether your water comes from surface reservoirs or ground-water wells, the chances are it contains some hardness minerals. This is because of the nature of water itself. Water is often called the “universal solvent” because of its ability to dissolve just about anything, even if only to a small degree. The United States Geological Survey estimates that 85% of all homes in the United States suffer from hard water.

The vast majority of dissolved hardness minerals in residential water supplies are calcium (Ca) and magnesium (Mg), which come from the aquifer rocks. Other dissolved elements besides Ca and Mg are also found in ground and surface waters. Hardness is normally expressed as a concentration of dissolved calcium carbonate (CaCO_3). Common units for hardness concentration are given below.

1 grain per gallon (GPG) = 17.1 mg/L = 17.1 PPM

The hardness scale offered by the Water Quality Association (WQA) is shown below.



Dissolved hardness minerals can cause numerous problems for the plumbing system in the home. Probably the biggest impact is seen as scale formation. Where water is hard, calcium carbonate (CaCO_3) scale build-up will occur on faucets, sinks, counters and anywhere water is used regularly (see Figure 1). Scale build-up is the most damaging and costly *inside* the plumbing system where it cannot be seen. Heated hard water forms a scale of calcium and magnesium minerals that decreases the efficiency water-using appliances, especially water heaters, and



Figure 1. Hardness scale build-up on a sink.

leads to premature failure. Pipes can become clogged with scale that reduces water flow and ultimately requires pipe replacement.

Hard water also interferes with almost every cleaning task, from laundering to dishwashing to bathing and personal grooming. Soap used in hard water combines with the minerals to form a sticky soap scum, and is often seen as bathtub rings or on shower doors and is difficult to remove. Bathing with soap in hard water leaves a film of sticky soap scum on the skin and clogs pores. The film may prevent removal of soil and bacteria. Soap scum interferes with the return of skin to its normal, slightly acid condition, and may lead to irritation and dry skin conditions. Soap scum on hair may make it dull, lifeless and difficult to manage. When doing laundry in hard water, soap scum lodges in fabric during washing to make fabric stiff and rough. Incomplete soil removal from laundry causes graying of white fabric and the loss of brightness in colors. Continuous laundering in hard water can shorten the life of clothes by up to 15%, because of the abrasive nature of the mineral-laden soap scum. In addition, soap scum can deposit on dishes, bathtubs and showers, and all water fixtures.

The benefits of softening the water are many and include the following:



ADVANCED WATER SYSTEMS GROUP

Your Local Authorized, Independent Kinetico Dealer Proudly Serving in 77 Counties in 4 States!

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What is Hard Water?

BENEFITS OF SOFT WATER

- Clean, soft skin and hair
- Cut soap use by 50% or more
- Appliances more efficient & last longer
- Save 19-35% energy heating water
- Save money on health-care products
- Whole house is cleaner
- No more scale buildup or stains
- Less work to keep home clean
- Clothes last longer (15%+)
- Saves the family \$500-\$800+ per year from the effects of hard water

Treatment for Hardness

The classic water softener is the *only* way to reduce water hardness. All water softeners work on the same basic principle. The hardness minerals calcium and magnesium (as well as soluble iron and manganese) are removed from the source water using a process called ion exchange.

The medium for ion exchange is called the ion exchange resin and is commonly tiny activated polystyrene beads that have been pre-loaded with sodium (Na^+) or potassium (K^+) ions on active sites. When the hard water encounters the resin column inside the softener tank, the Ca^{2+} , Mg^{2+} , Fe^{2+} , and Mn^{2+} ions are strongly attracted to the sites on the resin beads. Thus, they cling to the beads, displacing the Na^+ or K^+ atoms, which depart into the water stream. By the time the water exits the resin bed, the resin has trapped all the hardness minerals and the softened water is free of Ca and Mg.

Eventually, depending on water use, water hardness and the size of the bed, the resin bed becomes saturated with Ca^{2+} , Mg^{2+} , Fe^{2+} , and Mn^{2+} and cannot effectively remove any more hardness. Then the bed must be "regenerated" before further use. The regeneration step is achieved by flushing the ion exchange bed with a brine mixture (salt and water), which releases the trapped ions from resin and sends them down the drain. The resin bed is then backwashed with water before it is ready for service again. Conventional single-tank water softeners often struggle with this regeneration step because they are forced to use untreated water with hardness, iron and manganese to clean the system. This leads to poor system performance.

Moreover, when a conventional single-tank water softener enters a regeneration cycle, the resin bed is not available for water softening. Thus, hard water will be entering the home during regeneration cycles.

Kinetico has solved these troublesome issues with their unique twin-tank, non-electric design. See all the advantages of the Kinetico systems below:

ADVANTAGES OF KINETICO SYSTEMS

1. Non-electric The Kinetico water conditioning systems require no electricity. The advantages of this are huge:

- a. No delicate and expensive printed circuit boards to degrade, short out, repair or replace. No electric solenoids to fail. Nothing to set or adjust. No timers.
- b. Not affected by power outages, which render electric units non-functional.

2. Twin-Tank system Conditioned water is available in the home 24 hours a day, 7 days a week. Even when one tank is being regenerated, the other tank is providing conditioned water to the home - without interruption! The Kinetico system is 100% "demand-operated". This means the system works based on how much water is used, not according to some arbitrary time setting or fixed settings.

3. Conditioned water used to regenerate The entire regeneration cycle is done using conditioned water from the tank that is in-service. It also regenerates using a "counter-current flow" giving better salt usage efficiency and longer media life. No more iron fouling or hardness build-up in beds or valve.

4. All moving parts bathed in conditioned water All moving parts in the Kinetico are in contact with only treated water. This prevents fouling and scaling up of any of the critical control module components, passageways, valves, or moving parts.

Call Today for a **FREE On-Site Water Test**

1-877-609-2837