# Water Quality and Ionizers

The following information and guidelines will help you understand the role **water quality** plays in ionizer performance and longevity. From this perspective, you will be better able to make an informed investment in a water ionizer—and your health.

Before purchasing a water ionizer, you'll need to know what kind of water quality you currently have—whether it's hard water (high mineral content) or soft water (low mineral content), and what sort of contaminants you're dealing with. Most people think water is just plain old $H_2O$ and that it's the same whether it comes from a bottle, a tap, or a well.

The truth is, water quality varies widely throughout North America, and this variation has a significant impact on the performance and longevity of your ionizer. Variations in water depend on many factors, and there are two basic causes:

1. Natural environmental factors, and
2. Contaminants (both man-made and those that occur naturally).

Type and concentration of contaminants depends on how close the water is to population centers, industry, livestock and agricultural operations.

Changes in water quality are mainly due to the source of the water supply—sources such as aquifers, rivers, reservoirs, run-off, wells, and springs. Mineral content varies and depending on the surrounding environment, each water source will have its own unique properties that affect water taste and smell—and performance in an ionizer unit.

## The Scaling Effect of Hard and Soft Water

If you live in a hard water area, you'll know, because it's more difficult to create soap lather while bathing or doing household cleaning. You may also notice mineral deposits on dishes, or a ring of soap residue in your bathtub. These are not signs of poor housekeeping, but rather signs of hard water, which contains high levels of calcium, iron, or magnesium mineral ions.

Hard water mineral deposits, or "scaling," can clog pipes and decrease the life of virtually all appliances in the home, especially those that use hot water. It builds up in tea and coffee pots, and clogs and sometimes ruins water heaters. Minerals can also build up on the plates inside the ionization chamber and internal tubing of your ionizer, thus decreasing performance and longevity. As scale builds up inside the chamber, the strength of ionization is diminished. Clogged tubing can lead to decreased water flow.

Very soft water (which is acidic) can corrode the metal pipes in which it is carried, and as a result the water may contain elevated levels of cadmium, copper, lead, and zinc.

## Hard and Soft Water and Ionizer Performance

An ionizer requires mineral content to operate, and it is the minerals that carry an electrical charge that produces specific alterations in ionized water. Water that has little or no mineral content, such as reverse osmosis or distilled water, has no pathway for the electrolysis or "ionization" to occur.

**It is important to note that all water found in nature has dissolved minerals, so this type of "pure" water is considered a man-made phenomenon.**

Our bodies resonate with natural water, which contains minerals, rather than mineral-free bottled water. The calcium, potassium, and magnesium in natural water are known as "essential, alkalizing minerals," and they are important for good health.

The more mineral content your water has, the more easily your ionizer can alter the water, and the better the ionizer performance. The less mineral content, the harder it is for your ionizer to create alteration in your water and this can weaken the ionizer performance.

**In simple terms, an ionizer will perform better with mineral-rich or hard water, and will have a more difficult time with soft water, or water low in mineral content.**

Ionizers are designed to perform optimally within certain water quality parameters; too many minerals may damage an ionizer, and with too few there may be decreased performance.

## Hard water in the US

According to the United States Geological Survey, 85% of US homes have some level of hardness in the water. In most areas the level of hardness is acceptable for ionizers. The areas in the US shown in red on the map below will generally have the highest levels of hardness.

Ionizers will perform very well in most of these areas. However, be aware that there are isolated pockets in Arizona, Southern California, Texas, Utah, New Mexico, and the midwest and in well water sources all over the US that have extreme hard water, which can cause ionizer malfunction and long term damage. Please see the *Water Quality Requirements* section below for specifics.

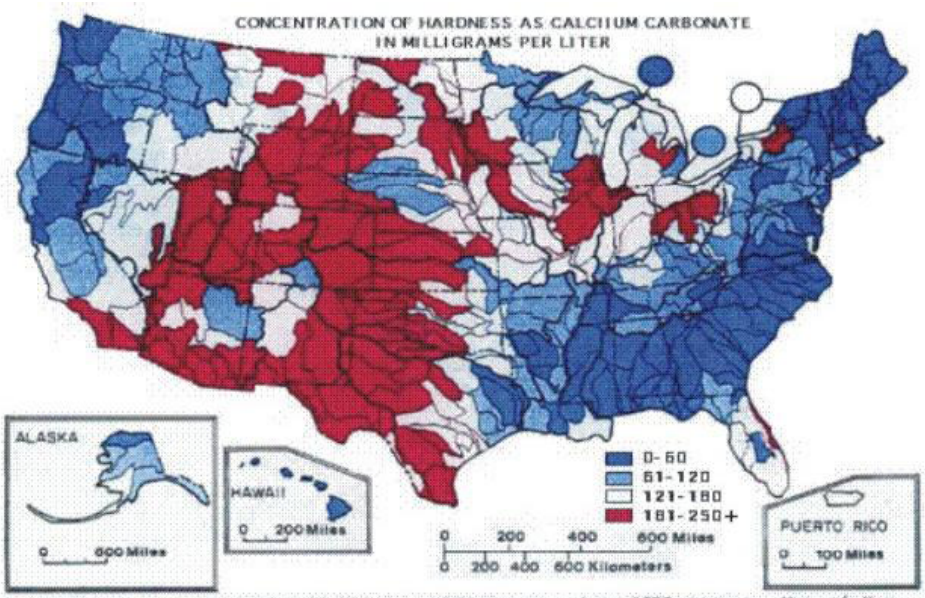


Figure 5.--Mean hardness as calcium carbonate at NASQAN stations during 1975 water year. Map at bottom is colored to show station data representing flow from the accounting unit.

NOTE: The above map is only to be used as an approximation to gain a general understanding of the water hardness of a given area. The measurements in any area can be higher or lower, especially if you are on well water. The softest water occurs in parts of New England, South Atlantic-Gulf, Pacific Northwest, and Hawaii regions. It is important to note that these are generalities; you can find well water sources in soft water areas that have very hard water and conversely, you can find soft water in hard water areas.

## Water Quality Requirements

Most water in North America will fall between the two extremes specified below and will allow for good performance and longevity. If you have extreme water quality, check with us first because there may be an easy solution. If there is not an easy solution, we can work with you to determine a solution.

We do not recommend using a water ionizer without pre-treatment of water that has one or more of the following measurements:

- Hardness (Calcium Carbonate) over 316 ppm (18.5 grains)
- Iron over .3 ppm
- TDS below 40 ppm or over 600 ppm
- Calcium above 50 ppm

**Note: Some reports will show "ppm" and some will show "mg/l." They are the same. Knowingly operating your ionizer above these levels may void your warranty and/or decrease your ionizer's performance.**

## Pre-treatment Options

**Reverse Osmosis and Remineralization Cartridge**

The only way to reduce TDS is with Reverse Osmosis. Reverse Osmosis will also reduce hardness. Use an iron prefilter cartridge for all water with iron of .3 or higher, unless you are applying Reverse Osmosis, which will also remove the iron.

**Softeners**

We do not recommend using an ionizer downstream or after sodium-based ion-exchange water softeners. Potassium based ion-exchange softened water is acceptable, but be advised your water will be calcium and magnesium free. If you have a sodium ion-exchange softener, you will need to do one of the following:

- Bypass the system (if the source water meets the above Water Quality criteria)
- Change the plumbing connectors and install the softener on the hot water only
- Install a Reverse Osmosis unit and remineralization cartridge

**Reverse Osmosis (RO) and Distillers**

Ionizers will not work downstream (or after) an RO or distiller. Many homes with an ion-exchange softening system will have an RO system. These systems remove virtually all the mineral content and leave the water with no conductivity. If you have an RO or distiller, you will need to do one of the following:

- Bypass the system (if the source water meets the above Water Quality criteria)
- Install a remineralization cartridge after the RO system

**Extreme Softness**

This is water that is very low in mineral and dissolved solid content, which gives water its conductivity and would have TDS below 40 ppm.

If you live in an area with extremely soft water (or if you use a rainwater catchment system), you may not achieve the optimal performance of your system. In this situation, a remineralization cartridge is recommended. We can recommend or supply a remineralizing cartridge.

**Well Water**

In addition to the measurements of water quality for ionization performance and longevity, there are health safety related issues involved with well water. If you are on a well system, you will need a well water test to determine your water quality. Many states require a well water test report in the closing documents of a home sale. Many local governmental Health Agencies will test your well for free. We recommend contacting them first.

You can buy a home water test kit that will test for all the items you need to know about, plus a few more. Call us for details.

If you prefer, we also recommend Environmental Testing and Research (ETR). A sample bottle will be sent to your location with a postage paid return box. Once the sample is received in the lab, the results will be emailed in approximately 3 days. This service is available in the US. Call us for Canadian recommendations.

ETR can be reached at 800-344-9977. Request the "Standard Scan" test.

**Chloramine**

Many municipal water systems are changing from chlorine to chloramine treatments. The Biostone Filtration System is probably the best counter top water filter on the market and is effective against most common contaminants and chlorine. Its primary filtration media is granulated activated carbon (GAC).

GAC is not designed to remove chloramine. No GAC filter will be effective at chloramine removal. A special prefilter is needed to remove this new chemical from the water. It is available by special order—please call or email us for details.

## Important Notes

Please contact us if your water falls into any one of the above categories and you are unsure what to do. If you have an extreme situation we will work with you to find a solution.

If your water is within 10% of two or more of the Extreme Hardness categories, you could possibly experience performance issues with your ionizer. You may require pretreatment. Please contact us and we will work with you to resolve it.

If you are uncertain of the water quality in your area, please contact your local water supplier and request the specific Water Quality information above. The appropriate phone number will be on your water bill. Or, if on a well, contact your local health dept to see if they have a water testing service.

For more information, visit us at **amazingdiscoveries.com** or give us a call at **1-888-856-9472.**

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