

Water Treatment Alternatives

Distillers, Reverse Osmosis and Filtration Systems

By Charles Strand, President, Sun Water Systems

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When comparing the benefits of different home water treatment methods, first keep in mind that there are no bad filters...any filter is better than no filter. The choice to be made is simply which filter produces the healthiest water and represents the best value.

With the recent focus on water's importance to our health, and problems associated with contaminants in our drinking water, the water treatment industry is experiencing explosive growth. As a result of the increased demand for home water treatment systems, a multitude of companies have entered the market. Not surprisingly everyone seems to be claiming to have the best product, but in reality there can only be one product that is truly the best. Fortunately in the water treatment industry being the best is not a matter of opinion or theory. The best product is the one that produces the highest quality water at the best price. The performance of a particular water treatment product can easily be verified by reviewing the product's Performance Data Sheet, which lists all the contaminants the system has been certified to remove and to what degree. The law in California and several other states requires that this information be included as part of the company's literature, as well as the ongoing replacement cartridge cost, and that a copy be enclosed with each product.

It is also important to look at the advantages and disadvantages of other products or technologies even though they are not leading brands, such being the case of reverse osmosis and distillation systems. Although none of the leading brands employ either of these de-mineralizing techniques, there is an ongoing debate over the healthfulness of de-mineralized water vs. filtered water that still contains the natural minerals.

While there are studies that argue both sides of this debate, after 15 years of passionately studying water-related issues, the benefits of drinking naturally balanced water with minerals vs. de-mineralized water, just makes more sense. From a non-scientific perspective, the fact that nowhere on this planet do we find naturally occurring de-mineralized water, to me should tell us that we were not meant to have it. I've always believed that our creator knew what was best for us and provided us with what naturally was best for our body. In nature all fresh water contains natural minerals like calcium, magnesium and potassium. On a more scientific side, there are several very credible research reports and books that stress the more recent opinion that long-term consumption of de-mineralized water can in fact be dangerous.

Dr. Paavo Airola, cancer expert and author of "How to Get Well," and "Cancer...Causes, Prevention and Healing," also reports that "Long term consumption of distilled water eventually results in multiple mineral deficiencies."

Two very negative things happen when we consume water that has been stripped of its natural minerals. First, because de-mineralized water contains more hydrogen it is an acid with a Ph below 7. Any time we consume an acid substance our body will pull minerals from our teeth and bones to produce bicarbonate in order to neutralize the acid. Second, it has been proven that when our body fluids become more acid than alkaline the product of free-radicals increases, causing increased cancer risks. Many studies suggest that cancer cells can only grown in an acid

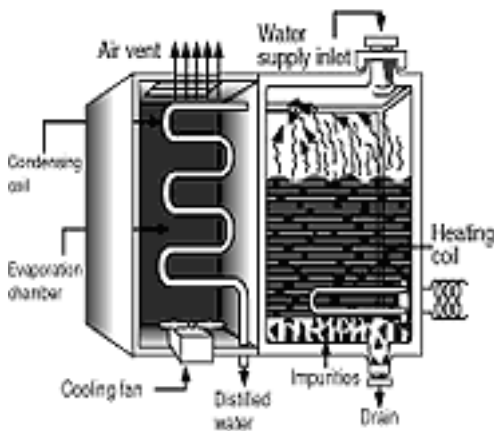
environment. This theory seems to be supported by the fact that around the world the areas where people live the longest, most disease-free lives, are the areas that have the most alkaline water — water with the highest mineral content. (Remember that the water we drink makes up over 70% of our body.)

Reverse-osmosis and distillation were first developed over 40 years ago for the printing and photo processing industries, which require mineral-free water. Because of the popularity and demand for home water treatment products, many companies have marketed these products as “state-of-the-art” drinking water systems, which they simply are not. Often these products are marketed by using a demonstration that measures the TDS (total dissolved solids) and implies that this measurement shows the system’s effectiveness at removing contaminants. TDS meters measure the dissolved minerals in water, primarily calcium and magnesium, and have little or nothing to do with contaminant levels.

The following paragraphs give a basic description of how each of these systems work and their relative comparison to AQ-4000 multi-stage filtration process.

Point-of-Use Distillation

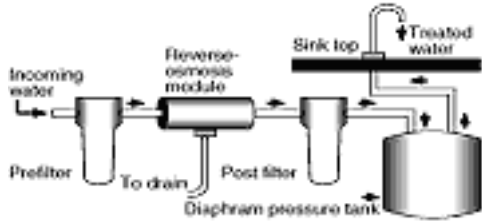
POINT-OF-USE DISTILLATION SYSTEM



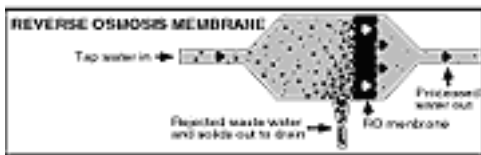
This process passes water over a heated coil, causing the water to vaporize and become gaseous. The steam then rises and transfers back into a liquid. This process separates water from inorganic compounds like lead, calcium, magnesium, etc. Distillation also destroys bacteria. This process is not very effective at removing organic chemicals since they typically vaporize at a lower temperature than water and are transferred in the steam. A distiller should always be used in conjunction with a carbon filter. Distillers produce water at a very slow rate and at a per gallon cost of 20 to 22 cents per gallon.

Reverse Osmosis

CONFIGURATION OF UNDERSINK REVERSE OSMOSIS SYSTEM

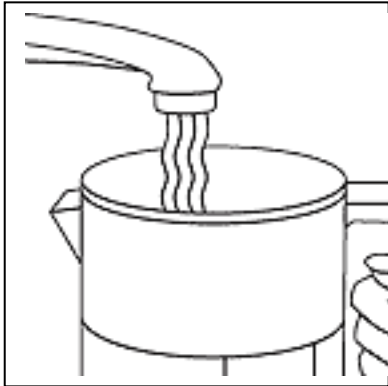


HOW A REVERSE OSMOSIS MEMBRANE FUNCTIONS



Reverse Osmosis (RO) is a process that exposes water under pressure to structure. Because most inorganic contaminants are of a larger molecular size than water, the membrane rejects certain contaminants, minerals, and a large part of the water. The portion of water that passes through the membrane is stripped of inorganic compounds and trace minerals. Because many synthetic chemicals like herbicides and pesticides are smaller molecularly than water, an RO system must also be used in conjunction with a carbon filter. RO systems require adequate water pressure and extensive maintenance. Because most point-of-use RO systems produce less than 1 gallon per hour, they require a diaphragm storage tank. Reverse osmosis typically wastes 2 to 3 gallons of water for every gallon it produces and has an 18 to 24 cents per gallon usage cost.

Pitchers and Carafe Style Filters

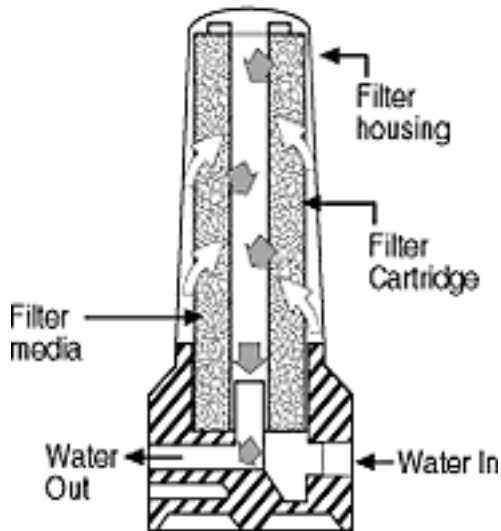


In recent years these types of filters have emerged as low cost alternatives to tap water and bottled water. Keeping in mind that any filter is better than no filter, these products are by far the least effective and the most costly to use. Pitchers and carafe filters are sold on the “Polaroid Principle”... Sell the camera cheap and make it up on the film sales. The result is the same with these pour-through pitcher filters — lower quality at a higher price. The average pitcher filter sells for around \$25 and includes one 30-gallon filter cartridge. Because of the small size of these cartridges, they have a very limited level of effectiveness and a low capacity.

The standard pour through cartridge (Brita, who FYI is owned by Chlorox Bleach Co.) retails for around \$6 to \$8 and has a capacity of 30-40 gallons, which results in a per gallon cost of 20 cents for a manual pour through filter. These filters also require you to keep track of how many gallons you’ve poured through it and offers a very limited scope of effectiveness. While pour through filters do offer a slightly improved alternative to tap water, they by no means can offer the quality, convenience and economy of a good point-of-use treatment system.

Carbon Block and Granular Carbon Filters

Standard Carbon Block Filter



These are the most common style of countertop and under the sink systems (POU, point of use). Granular carbon filters and carbon block systems basically perform using the same process of contaminant removal, adsorption, which is the chemical or physical bond of a contaminant to the surface of the filter media. GAC, granular activated carbon, is recognized by the U.S. EPA as the best available technology for the removal of organic chemicals like herbicides, pesticides, and industrial chemicals.

Carbon block filters have essentially the same performance characteristics with a few added advantages. Carbon block filters are extruded or compressed so that the carbon medium is in a solid form. This gives the ability to precisely combine multiple media in a sub-micron filter cartridge. By combining different media the ability to selectively remove a wide range of contaminants is achieved. Also, the sub-micron pore structure gives the added benefit of parasite or cyst reduction. By creating a sub-micron physical barrier, the filter can eliminate dangerous organisms like *Cryptosporidium* and *Giardia*.

Carbon-based filters, by far, have the ability to produce the healthiest water when configured properly. Different types of carbons can be combined with a variety of other catalytic filter media to naturally and selectively remove contaminants while leaving the natural minerals intact.

It is essential for the best performance to be achieved that a multi-stage process be used in order to remove contaminants in stages. Taking out the most concentrated and competitive chemicals first, like chlorine, allows the final stages of the filter to achieve a much higher level of effectiveness, such as herbicides and pesticides.

In Conclusion...

Health, wealth and happiness are usually the result of a conscious effort in a positive direction. Every action we take or consciously omit from affects our physical and mental well being to some degree.

Many of us take our health for granted until it begins to fade and then its value becomes overwhelmingly clear. Disease and illness are the cumulative result of many factors. We live in a world where we have sacrificed the purity of our environment for convenience, and the price we pay is ultimately our health.

Once we realize that the health of our planet is directly related to our own well-being, we can begin to create a change, a change in our own personal environment and in the awareness of the world around us.

Ingestion of water borne chemicals is thought to be one of, if not the primary factor, in the current epidemic of degenerative disease in our society. Water the only aspect of our personal environment that we can easily take complete control over. We can take steps to ensure that every drop of water that we consume, or come in contact with, is clean and healthy.

Air and water are the two primary components to life. It is difficult if not impossible to ensure the quality of the air we breathe, which only makes the purity of our water even more essential. Our body's ability to flush out toxins and properly assimilate nutrients influences our health more than anything in our lives. Both of these critical functions depend heavily on an abundant intake of clean, chemical-free water. The purity or importance of water can no longer be taken for granted. Fortunately, healthy water is both affordable and easy to obtain with quality Point-of-Use water treatment in our own homes, where it matters the most.

The information presented in this booklet is the result of over 15 years of passionate involvement in the water treatment industry. My sincere belief in the importance of clean water and the body's ability to achieve health and well being far beyond conventional beliefs is the basis for continued infatuation with this topic. I feel very fortunate to be involved in an industry experiencing tremendous success along with a worthwhile cause. Knowing that the products we promote will each ultimately enhance the quality of someone's life, and possibly prevent disease, is a feeling of accomplishment like no other.

Water is a wonderfully important part of our lives and something that every living creature has in common. Like all things essential to life, water quality should be a top priority in our quest for health and happiness.

Sincerely,

Charles Strand