ADVANCED WATER SYSTEMS GROUP

Proudly Presents

Frequently Asked Questions (FAQs) About Residential Water Quality

Is My Drinking Water Safe?

Drinking water has become one of the most important considerations people have these days. Although tap water is verified "safe" by state and local authorities, it often does not taste good. The importance we place on drinking water is easily seen by the ever-expanding bottled water aisle in the grocery store. Unfortunately, the bottled water industry is poorly regulated and the consumer should always question the actual quality of bottled water. Moreover, the use of BPA, phthalates and other plasticizers pose contamination risks to bottled water.

The best method of ensuring high purity, good tasting drinking and cooking water in the home is by using a process known as **Reverse Osmosis** (RO). Reverse Osmosis was developed in the late 1950's with support from the U.S. government, as an economical method of desalinating seawater.

The RO process makes use of something called the semi-permeable membrane. The semi-permeable RO membrane provides two distinct water treatment processes. First, it is the ultimate mechanical filter, straining out virtually all particulate matter, turbidity, bacteria, microorganisms, and asbestos - even single molecules of the heavier organics. To appreciate the fineness of this ultra-filter, its pores are on the order of .0005 microns or .0000002 of an inch!

Second, it removes dissolved impurities (e.g. mineral salts, ions, toxic metals) by not allowing them to pass through the reverse osmosis membrane. This fraction of materials is normally called the Total Dissolved Solids or TDS. TDS values are normally measured using a conductivity probe and range from 10 to 1000 PPM in normal water supplies. The EPA has recommended a threshold of 500 PPM as the maximum concentration of TDS in drinking water.

Reverse osmosis membranes have the ability to remove and reject a wide spectrum of impurities from water and they do it with very minimal energy usage. In fact, it just requires normal household water pressure. With the exception of distillation, RO is the only known process that can effectively remove the following types of impurities.

Although RO membranes are very effective at removing contaminants, trace amounts of common metals from the source water will still exist in the purified water, enhancing flavor. The percentage passing through depends on such things as membrane polymer type, membrane condition (e.g. age, cleanliness, temperature, and driving pressure (energy), but is normally less than 5-10% of initial content.

CONTAMINANTS REDUCED BY REVERSE OSMOSIS

- Particulate matter, turbidity, sediment, etc.
- Colloidal matter
- Total Dissolved Solids (Na, Ca, Fe, Mg, Mn, CO_3, etc)
- Toxic Metals (Pb, Cd, Ba, Hg, etc.)
- Radioactive elements (uranium, radium, radon)
- Microorganisms (giardia, oocysts)
- Fluoride/fluorine
- Asbestos
- Pesticides and Herbicides
- Heavier organic molecules (MW>300)
- Nitrates/Nitrites
- Silica (SiO_2)
- Pharmaceuticals

To understand reverse osmosis, first consider normal osmosis, which is the same process happening all the time at the cellular level in living organisms (the cell wall is a semi-permeable membrane). The two processes are compared in Figure 1.

In each case there are two regions of water with different levels of impurities separated by the semi-permeable membrane. In normal osmosis, the "osmotic pressure" causes water to permeate the membrane from the side with fewer impurities to the side with more impurities causing the impurity concentration on both sides to approach equal values (equilibrium).

In **Reverse Osmosis**, the process is forced to go backwards by applying pressure to the membrane from the high-impurity side. This pressure forces the water molecules back through the membrane resulting in purified water on the permeate side, which is stored in a tank for drinking.

As contaminants are removed from the water by the RO membrane, they are automatically diverted to a waste drain so they don't build up in the system as with conventional filters and purification devices.

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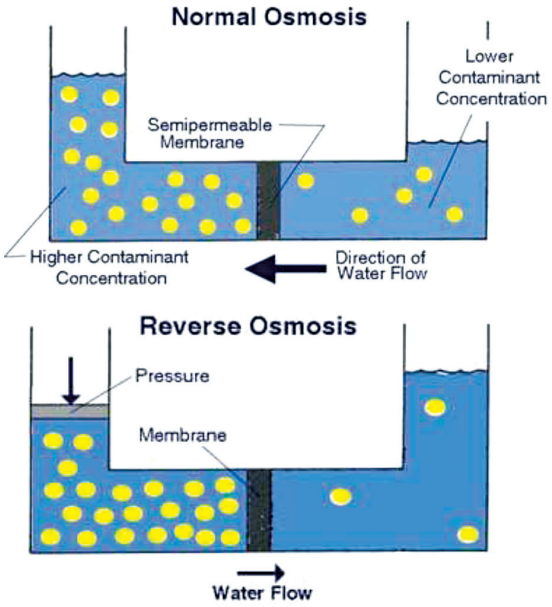

Figure 1. Comparison of normal osmosis (upper) and reverse osmosis (lower).

Since RO membranes are ineffective in removing the lighter, low molecular weight volatile organic compounds (VOCs) such as THMs, TCE, vinyl chloride, carbon tetrachloride, etc., these toxic chemical contaminants are removed by carbon filters added to the RO system. RO systems come equipped with pre- and post-filters with activated carbon, to reduce VOCs.

The Kinetico Reverse Osmosis System

The **Kinetico K5 Drinking Water Station** offers the latest and most flexible RO technology available today. These systems conveniently mount under the sink, in the crawlspace, garage or basement, and they feed a separate faucet at the sink and can also feed the refrigerator and up to 5 other chosen locations. The **K5** system has an exclusive five-stage water purification process. These stages are given below:

1. A 5-micron sediment pre-filter: Removes any fine particulate and is combined with carbon filtration for chlorinated supplies.

2. The RO membrane module: The **K5** utilizes a 75- GPD thin-film composite (TFC) membrane for the maximum contaminant removal efficiency.

3. A non-corrosive storage tank: Permeate water is stored in a special Water-on-Water storage tank made of all inert materials. This allows RO water to be available at all times.

4. The patented MACguard Filter™: The MACguard™ filter module is a densely compacted carbon block, which reduces VOCs in the permeate water as well as any residual chlorine, and unpleasant tastes and odors.

5. A special lead-free faucet: The system has a designer faucet which is certified lead-free.

The **K5** drinking water station also boasts additional features giving it a 99.9% rating in ***Consumer Reports.***

FEATURES OF THE KINETICO K5 SYSTEM

- **Automatic shut-off** Once the storage tank is full, the system automatically shuts off. In doing so, the pressure is relaxed against the membrane.
- **Everclean™ rinse** This patented feature is unique to Kinetico. The Everclean™ rinse is a membrane flush using purified water. This greatly lengthens the life of the RO membrane.
- **The MACguard Filter™** The MACguard Filter™ meters the water that is purified by the system. With the K5 system, after 500 gallons are consumed, it automatically shuts off. This protects from filter overloading, allowing contaminants to enter their drinking water.
- **The PureMometer™** This unique feature is a visible filter life indicator allowing the owner to visually estimate the remaining life on the filters.
- **Flex-Filtration™** The Kinetico K5 is the only RO system available that offers unique Flex-Filtration. The K5 has additional ports in the system for specialized filter cartridges for specific water quality issues. This includes these special filters:
- **Arsenic Guard** (removes As(III))
- **Mineral Plus** (adds healthy minerals)
- **VOC Guard** (reduces chemicals)
- **Perchlorate Guard**
- **Chloramine Guard**

Call Today for a FREE On-Site Water Test

1-877-609-2837

Kinetico®
water systems