What contaminants can reverse osmosis remove?

Common Tap Water Contaminants			
Contaminant	**Average** Influent Concentration (mg/L)	**Average** Effluent Concentration (mg/L)	**Average** Percent Reduction
Arsenic V	0.28	0.0035	98.70
Arsenic III	**See Below	**See Below	**See Below
Barium	10.2	0.207	97.90
Cadmium	0.036	0.0005	98.60
Chromium (Hexavalent)	0.15	0.013	91.30
Chromium (Trivalent)	0.17	0.01	94.10
Copper	3.1	0.03	99.00
Cysts	149357 #/ml	5 #/ml	99.99
Turbidity	10.2	0.26	97.50
Fluoride	8	0.5	93.90
Lead	0.15	0.002	98.60
Nitrates	-	-	80.00
Radium 226/228	25 pCi/L	5 pCi/L	80.00
Selenium	0.1	0.008	92.00

Other TDS contaminants reduced by up to 98%: Aluminum, Ammonium, Bicarbonate, Calcium, Chlorine, Chloromines, Chromate, Cyanide, Ferro cyanide, Iron, Magnesium, Mercury, Manganese, Phosphate, Silicate, Silver, Sodium, Strontium, Sulfate, Sulfite, Thiosulfate, Zinc.

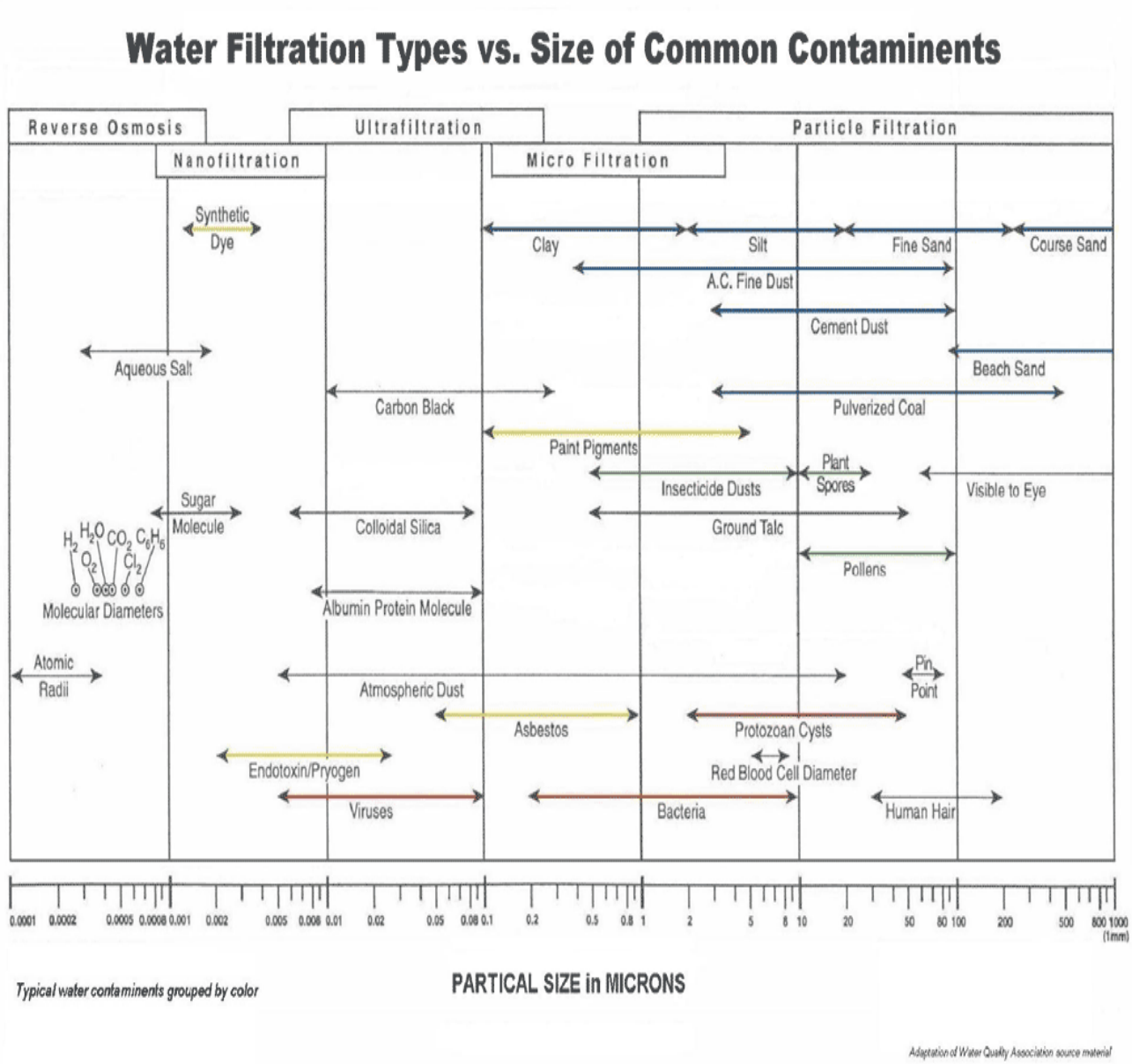
Note: Your results may vary depending on regular maintenance, general condition of unit, and initial water conditions. Home Master is not designed to treat microbially unsafe or non-potable water without pre and/or post treatment depending on model and conditions.

*See the suspended contaminants relative to their sizes in our **Particle Size Chart**

****Please note that RO systems provide effective filtration for Arsenic 5 (AS5), but not Arsenic 3 (AS3).** Chlorination converts AS3 into AS5. Is your well chlorinated?

Depending on the distribution of the arsenic species in your water chlorination might be required to bring it down below the recommended level which is 10ppb (0.10 ppm). For example you have 12ppb of arsenic, if 5 are AS5 and 7 are AS3, then the RO should bring down the AS5 level sufficient to bring the overall level below the 10ppb EPA safe level. **There are arsenic speciation tests available if you would like to be sure, and if your water is not chlorinated.**

Particle Size Chart



Which Filter Change Set Do I Need?

Undersink RO Systems	MODEL				
Maintenance Item	**TM**	**TMAFC**	**TMIRON**	**TMULTRA**	**TMHP**
ISetTM8	Annually				
ISetTMA8		Annually			
ISetTMFe8			Annually	Year 3	
ISet-TMUL-MY12				Year 1 & 2	
Iset-TMHP-MY12					Year 1 & 2
UVFilter3				Year 3	Year 3
ISetTMFe8-A					Year 3
Mem-TFC50	3-5 Years	3-5 Years	3-5 Years	3-5 Years	3-5 Years
Inspect tubing and fittings for leaks & wear	Annually	Annually	Annually	Annually	Annually
Ensure tank pressure measures 7.5 psi empty	Annually	Annually	Annually	Annually	Annually
Sanitize System	Annually	Annually	Annually	Annually	Annually
The filters and UV bulb are changed every year on UV equipped systems, every 3rd year the entive UV module is changed. Then restart the cycle.					
Based upon family of four; 70F, 77psi, 250 ppm nacl TDS, <10 gpg hardness, 0 iron bacteria. Your results may vary.					
This information subject to change without notification.					

Whole House Filters	MODEL				
Maintenance Item	**HMF1C**	**HMF2SdgC**	**HMF2SmgCC**	**HMF3SdgFeC**	**HMF3SmgNCC**
ORing122*	✓	✓	✓	✓	✓
CFdgd2501-20BB		✓	✓	✓	✓
CFrfgac20-20BB	✓	✓		✓	
Cfrffe-20BB				✓	
CfKDF85GCC-20BB			✓		✓
CFpltn-20BB					✓
Inspect system for leaks, wear, & signs of stress	Annually	Annually	Annually	Annually	Annually
Inspect **oring** for damage & deformation*	At filter change	At filter change	At filter change	At filter change	At filter change
Sanitize System	At filter change	At filter change	At filter change	At filter change	At filter change
***It is a good idea to keep a set of spare orings - 2 per housing. You may need to change them each time you open the housing.**					
Note: Filter life will vary based upon contaminant level and usage.					
Note: Protect system against freezing, direct sunlight and the elements.					

Whole House Water Filter Buying Guide

What is a Whole House Water Filter?

A whole house filter connects to the main water line entering your house so that all of the water dispensers in your house – faucets, toilets, showers, baths, kitchen, laundry – dispense treated water. Typically the whole house water filter is connected to the main water line before it splits into the hot water heater. Customers wishing to purify the water to their garden and sprinkler systems may find this to be a bit more challenging as the main water line coming off the city system often splits off into a "house" water line and a "yard" water line in the house's foundation slab or at the street level before the house. Consult your home's blueprint or city water utility for further details.

What type of Whole House Water Filter do I need?

This will depend on what types of contaminants are in your water. **First determine what you need to remove from the water.** If you are on a municipal city water supply, then the typical contaminants of concern are chlorine (or chloramines) and chemicals, sediment and hardness minerals. The types of contaminants typically found in a private well water supply are sediment, iron and hardness minerals, but can vary from nuisance contaminants to toxic or damaging.

If you have a private well, please send us a copy of your most recent water analysis or get your well water tested so we can make a recommendation based upon the contaminants that are actually in your well water. Upon request most municipal water utilities will provide you with a water analysis.

Water Softening vs. Water Filtration

Water Softeners remove hardness minerals specifically, whereas water filters are designed to remove a broader range of contaminants. However they can be used together.

Common Types of Contaminants

Sediment – typically refers to visible particles in the water, which need to be mechanically strained out such as dirt, dust, rust and sand. Water supplies with high amounts of sediment should consider multiple stages of sediment filtration, with the

stages gradually becoming finer. Reusable filters should also be strongly considered. Water supplies with less sediment can use disposable, finer filters.

Chemicals – most chemical contaminants can be removed using carbon filtration. The most common chemical disinfectant found in municipal city water supplies is chlorine, which can be removed with a carbon filter.

Iron – there are 2 types of iron found in water supplies, ferrous (aka dissolved or clear water iron) and ferric (aka rust or red water iron). Red water iron and rust particles can be removed with a sediment filter, whereas clear water iron can be removed via oxidation or ion exchange. Factors affecting the life of an oxidizing filter are pH and the presence of Hydrogen Sulfide.

Selecting a Whole House Water Filter -- What to look for:

Flow rate – measured in gallons per minute (GPM), flow rate determines the amount of water available to run your shower, toilet, hot water heater, dishwasher, etc. When calculating your requirements look at the demand ratings printed on your appliances and toilet. Typical showerheads flow 2.5 to 5 gpm, toilet 5 gpm, dishwasher 3 gpm. Depending on the size of your house and family your water flow rate requirements may range from 15 - 40 gpm. A whole house filter system with a flow rate less than 10gpm is unacceptable for maintaining uninterrupted, comfortable water pressure during peak use.

Filter size – the larger the filter the longer the service interval, and the more water it will flow and with greater pressure. However port size has a greater impact on GPM and pressure. The ideal filter size for most homes is 4.5” x 20”, however large homes may require a second unit in parallel.

Filter life – sediment filter life will vary depending on the sediment quantity and quality. Good quality whole house 4.5” x 20” carbon filter cartridges will last 100,000 – 150,000 gallons in normal municipal water supplies. Stand-alone carbon filters with carbon beds, as opposed to carbon filter cartridges, will last much longer ONLY if they have a backwashing valve and a regular back wash cycle.

Port size – the ideal port size on a whole house water filter is 1”. Even if the home uses ¾” piping, using a 1” ported system will not create any bottlenecks when fitted onto the ¾” pipe. Whole house water filter systems with 1” ports and 4.5” x 20” filter carry more than enough water so that pressure drops are virtually non-existent.

Home Master Artesian Full Contact™

Alkaline Water

Reverse Osmosis System

Alkaline Water Ionizers - *Dirty Little Secret*

Most of the popular **alkaline water** ionizers sold today use a separation technology known as electrolysis to separate the water into acidic and alkaline water streams. Electrolysis does not filter or purify the water, it simply divides the incoming water flow into an alkaline stream and an acidic stream. The secret that alkaline water treatment devices which use electrolysis do not want you to learn is that any alkaline contaminants (anions) in the water such as Fluoride (F-), Mercury (HgCl3 1-), Sulfate (SO42-), or Nitrate (NO3-) will be carried along with the good alkaline minerals (calcium, magnesium) in the product drinking water.

Furthermore not only are the bad alkaline contaminants carried along into the product water stream -- they are actually concentrated so that, if present, they will be found in higher concentrations than before the electrolysis treatment because those contaminants were evenly distributed across a larger quantity of water that has now been concentrated into one side of a divided water stream. If present the product water will also contain chemical contaminants like chlorine, pesticides, pharmaceuticals, and VOCs if it does not incorporate and activated carbon filter. There is a much better alternative for meeting your family's alkaline water needs.

The purity you need, the pH you want™

The **Home Master Artesian Full Contact™** Alkaline Water Reverse Osmosis System™ gives you the finest Mineral Water on Tap™ by first stripping the water clean of virtually all contaminants - both good and bad - using the trusted reverse osmosis (RO) process, multiple carbon and sediment filtration stages, then channels the highly pure, but slightly acidic water through our artesian remineralization filter -two times -using our patented Artesian Full Contact Technology to rejuvenate and restore ONLY calcium and magnesium ions to make the water alkaline (pH 7.5—8.0). The result is highly pure, alkaline water, containing only desirable minerals. The Home Master Artesian Full Contact™ adds up to 100% more minerals than the Home Master Artesian™, and creates the best drinking water you will ever have. Guaranteed or your money back.

Home Master Artesian Full Contact™

Alkaline Water Reverse Osmosis System™
Patent# US 7,507,334 B1

Highlights:
· Alkaline Mineral Water on Tap™
· Trusted purification by reverse osmosis
· Remineralized & Ionized with ONLY desirable calcium and magnesium minerals
· Affordable, Fully Featured & User Friendly

Read our Reverse Osmosis System Buying Guide and view a graphic comparing contaminant and filtration size.

The system is designed for an undersink installation and comes fully assembled with 3' of tubing for each of the four connections - feed line IN, drain line OUT, storage tank, product water OUT. The system will perform best out of the box when installed in this manner. However many people choose to put their systems in the basement.

Please view our **Installation Videos**.

There are some things to consider before making the decision to remote locate the system.

TUBING: You will need some extra tubing to connect the system to the point(s) of use and potentially to one or more of the other connections. Extra tubing kits are available in both 1/4" and 3/8" sizes on the **Accessories** page. The system feed and the drain lines are both 1/4" and the lines to the tank and the RO faucet are both 3/8".

PRESSURE: The main source of output pressure from comes from the storage tank. The further it is located from the point of use - the worse the pressure will be.

****Once the tubing run exceeds 10' vertical or 20' horizontal you will experience some pressure loss.**

Getting the **Permeate Pump Upgrade** on your system will help somewhat, as will mounting the tank close to the basement ceiling, however in extreme cases an electric delivery pump may be required.

This consideration becomes exaggerated if you are on well water with weak pressure to begin with as your tank will fill less full and will discharge less forcefully at the outset. Many customers will try the installation without the delivery pump and are satisfied with the results.

Can I connect the RO system to my kitchen faucet?

The short answer is no.

Keep in mind that the RO water available for use at full pressure is the amount of water in the storage tank which is typically 3.2 gallons. The kitchen sink typically dispenses that water at a rate of about 2 gallons per minute. In the real world you will frequently run out of water.

The RO system can be physically connected to the kitchen faucet, but once the water in the storage tank is used, you will be left with only the RO system's production rate which is a trickle (50 gallons per day, or 2 gallons per hour). If the kitchen faucet is at a secondary sink that is only used for drinking and cooking water, such as a bar sink, then it is suitable.

How do I prevent water from ejecting from the air gap window of my air gap RO faucet?

Here are some things you can try **in order**:

1. Remove the “P” trap from your sink drain pipe and clean it out.

2. Run liquid plumber or use a real plumber to clean your pipes. Clean pipes with good drainage will reduce/eliminate your system backing up out of the air gap faucet.

3. Use a longer length of tubing to the drain saddle and wrap the excess in loops around the drain pipe.

4. Unscrew the plastic nut from the drain saddle and poke out the opening to make sure it is clear and nothing is lodged in there.

5. Move the drain saddle to a point closer to the sink, however this might transfer the “gurguling noise” from the faucet to the sink drain. If you mount the drain saddle on a horizontal section of pipe you will need to put the hole at a downward angle so the waste water from your system falls into the drain pipe, otherwise you will definitely have water backing up out of your faucet.

6. Insert the 3/8” tubing a few inches inside the drain saddle so that it hits the opposite wall of the pipe, and then curves down. This usually cures sink drain noise, but in your case it might make your backing up problem worse.

Do items 1-4 first, and then check your system for problems again. If you still have problems then do 5 and/or 6.

Reducing Reverse Osmosis Water Waste:

Overview

Wastewater is a by-product of the reverse osmosis water purification process. Even the best residential reverse osmosis systems will make almost 4 gallons of water brine for every one-gallon purified, while lower grade systems can waste as much as 8 gallons of water per gallon purified. Recently some companies have introduced "zero waste" reverse osmosis systems, which do not waste any water. These systems still produce brine water as a by-product of the reverse osmosis process, but can labeled as "zero waste" systems because the brine water is recycled; not flushed down the drain as wastewater.

The "Zero Waste" Reverse Osmosis System Process

"Zero Waste" reverse osmosis systems come in two basic types. The more advanced types of "zero waste" systems eliminate water waste by pumping the brine water into the hot water plumbing instead of down the drain. The drawback to this design is that the brine water injected into the hot water line can be discharged from your kitchen sink faucet on your hands, cooking, dishes, etc, and into your dishwasher. The less advanced types of "zero waste" systems pumps the brine water back into the cold water line feeding the reverse osmosis unit. The downside to this design is that the additional concentrated brine water in the feed water will force the reverse osmosis system to work harder and wearing down system components more quickly resulting in more frequent filter changes and overall shorter system life. Both systems are effective at eliminating water waste but their downsides are significant.

The Permeate Pump: Alternative to Zero Waste?

While a permeate pump equipped reverse osmosis system will still waste water, it can reduce the amount of waste water by up to 80%. Furthermore the permeate pump equipped reverse osmosis system disposes of the brine water rather than injecting it back into the system where it can end up on your dishes, cooking, or back in the filtration system reducing system life. The permeate pump brings additional benefits beyond reduced water waste such as faster water production, prolonged system life when, and slightly cleaner water.

"Zero Waste" Pros & Cons

+ No water waste
- Brine water discharge on hands, cooking or dishes; or Shortened system life and more frequent membrane changes

Permeate Pump Pros & Cons+ Improved system life and efficiency

+ Increased water production
+ Increased reserve tank holding capacity
+ Slightly cleaner water
- Some waste water

Partial list of Chemical Contaminants Which are Removed by Carbon Filtration:

Chemicals	**Organic Contaminants**
Acetaldehyde	2,4,5-TP
Acetaminofen	2,4-D
Acetic Acid	Acrylamide
Acetone	Adipates (diethylhexyl)
Alcohols	Alachlor
Amines	Aldicarb
Amyl Acetate	Aldicarb Sulfone
Amyl Alcohol	Aldicarb Sulfoxide
Antifreeze	Atazine
Benzene	Benz(a)anthracene (PAH)
Bleach	Benzene
Bisphenol A (BPA)	Benzo(a)pyrene (PAH)
Butyl Alcohol	Benzo(b)fluoranthene (PAH)
Butyl Acetate	Benzo(k) fluoranthene (PAH)
Caffeine	Bromodichloromethane
Calcium Hypochlorite	Bromoform
Carbamazepine	Butyl benzyl phthalate (PAE)

Chloral
Chloramine (catalytic carbon)
Chloroform
Chlorine
Chlorobenzene
Chlorophenol
Chlorophyll
Ciprofloxacin HCl
Citric Acid
Cresol
Defoilants
Dieldrin
Detergents
Diclofenac Sodium
Diesel Fuel
Dyes
Erythromycin USP
Ethyl Acetate
Ethyl Acrylate
Ethyl Alcohol
Ethyl Amine
Ethyl Chlorine
Ethyl Ether
Gasoline
Glycols
Herbicides
Hydrogen Peroxide
Hydrogen Selenide
Hydrogen Sulfide
Hypochlorous Acid
Ibuprofen
Insecticides
Iodine
Isopropyl Acetate
Isopropyl Alcohol
Ketones
Lactic Acid
Mercaptans
Methyl Acetate
Methyl Alcohol
Methyl Bromide
Methyl Chloride
Methyl Ethyl Ketone
Methyl Tertiary-Butyl Ether (MTBE)
Naphtha
Nitric Acid
Nitrobenzene
Nitrotoluene
Odors (general)
Oil Dissolved
Organic Acids
Carbofuran
Carbon Tetrachloride Chlordane
Chloroform
Chrysene (PAH)
Dalapon
Dibenz(a,h) anthracene (PAH)
Dibromochloromethane
Dibromochloropropane (DBCP)
Dichlorobenzene (o-,m-)
Dichlorobenzene (para-)
Dichloroethane (1,2-)
Dichloroethylene (1,1-)
Dichloroethylene (cis-1,2-)
Dichloroethylene (trans-1,2-)
Dichloromethane (methylene chloride)
Dichloropropane (1,2-)
Di-(2ethylhexyl) Phthalate (DEHP)
Diethylhexyl phthalate (PAE)
Dinoseb
Diquat
Endothall
Endrin
Epichlorohydrin
Ethylbenzene
Ethylene dibromide (EDB)
Glyphosate
Heptachlor
Heptachlor epoxide
Hexachlorobeneze
Hexachlorocyclopentadiene
Indeno (1,2,3-c,d) pyrene (PAH)
Lindane
Methoxychlor
Monochlorobenzene
Oxamyl (vydate)
Pentachlorophenol
Picloram
Polychlorinated byphenyls (PCBS)
Simazine
Styrene
Tetrachloroethylene
Toluene
Toxaphene
Trichlorobenzne (1,2,4)
Trichloroethane (1,1,1-)
Trichloroethylene
Trichloroethylene (1,1,2-)
Trihalomethanes (THMs)
Vinyl Chloride
Xylene (total)
2,3,7,8-TCDD (

Organic Esters
Organic Salts
Oxalic Acids
4-para-Nonylphenol
PCBs
Perchlorate
Pesticides
Phenol
Plastic Taste
Propioic Acids
Propionaldehyde
Propyl Acetate
Propyl Acid
Propyl Chloride
Primidone
Rubber Hose Taste
Soap
Sodium Hydrochorite
Solvents
Sulfamethoxazole
Sulphonated Oils
Tannins
Tar Emulsion
Tartaric Acid
Taste (DI Water)
Taste (From Organics)
4-tert-Octylphenol
THMs
Toluene
Toluidin