



# Green Inside and Out's WATER FILTER FACT SHEET

**Concerned about contaminants in your drinking water but not sure which filter is best to remove them? Use this fact sheet to inform you of your options so that you can make a water filter decision that's right for you.**

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## What's Out There?

There are many types of water filters on the market that use one or a combination of 10 basic water treatment technologies. The kinds of contaminants a filter can remove depends on its design. Look for certification by a well-known independent agency such as Water Quality Association or NSF International, which certifies filters as effective at removing particular contaminants. Look at your water supplier's water quality report to target specific contaminants of concern. (Note: No filter was found to remove 1,4 Dioxane, a contaminant found in detergents.)

*Here's more information about the technologies and how they work:*

### Carbon/Activated Carbon

Activated carbon is a substance that sticks to and removes contaminants from your water when it goes through a filter. Typically these filters come in three varieties: fibredyne block, the most effective type of carbon filter; carbon block, also a very effective type of carbon filter; and granulated activated carbon, the least effective carbon filter. With all carbon filters, their effectiveness depends on how quickly water flows through them—the quicker the flow, the less effective the filter.

**Can remove:** organic pollutants such as chlorine, asbestos, lead, mercury, volatile organic compounds (VOCs).

**Cannot remove:** inorganic pollutants such as arsenic, fluoride, hexavalent chromium, nitrate, perchlorate.

### Ceramic

Ceramic filters are made with small holes that allow water to pass through but stop solid contaminants like sediment and cysts. These filters do not remove any chemical contaminants from water.

**Can remove:** solid contaminants (sediment and cysts).

**Cannot remove:** chemical contaminants.

### Deionization

Deionization is a water treatment technique that uses an energetic process called ion-exchange to remove mineral salts and other electrically charged molecules (called ions) from water. These filters cannot remove microorganisms such as viruses and bacterias, nor non-ionic contaminants such as trihalomethanes and other VOCs.

**Can remove:** mineral salts, ion contaminants.

**Cannot remove:** microorganisms, non-ionic contaminants such as VOCs.

## Take Care of Your Filter

Purchasing a water filter is only the first step to healthier, cleaner water. After installing your filter, take the following steps to ensure it's kept in top working order:

1. Realize filter cartridges only last so long—so you'll have to replace your filter's cartridge on a regular basis.
2. Replace your filter's cartridge when it reaches its capacity. Some filters will alert you when your filter needs to be replaced.
3. Old or soiled cartridges may decrease the water flow rate through your filter. A slow flow is a sign your filter needs attention—whether that means replacing or cleaning the filter.
4. Note that reverse osmosis filters and water softeners need additional maintenance to work properly. Familiarize yourself with the owner's manual.

### Distillation

Distillation is a water treatment technique that heats water at a very high temperature so that it vaporizes, and then condenses the water vapor back into liquid water. This process can remove minerals, bacteria and viruses and chemicals with a high boiling point from water. However, it cannot remove chlorine and VOCs such as trihalomethanes.

**Can remove:** minerals, bacteria, viruses, chemicals with high boiling points.

**Cannot remove:** chlorine, VOCs.

### Ion Exchange

Ion exchange filters send water over a resin that switches out contaminating ions with those that are more benign. For example, one kind of ion exchange is water softening, which swaps calcium and magnesium with sodium. The resin used must be routinely recharged with new ions in order to ensure it continues working properly.

**Can remove:** ionic contaminants such as minerals.

**Cannot remove:** any non-ionic chemical contaminants.

### Mechanical Filters

Mechanical filters, like ceramic filters, are made with small holes that allow water to pass but stop solid contaminants. They cannot remove chemical contaminants, so often they're used with other technologies that do.

**Can remove:** solid contaminants such as sediment and cysts.

**Cannot remove:** chemical contaminants.

## Ozone

Ozone filters kill bacteria and other microorganisms in water but cannot remove chemical contaminants from water. So, often these filters are used with other filters that can remove chemicals.

Can remove: microorganisms.

Cannot remove: chemical contaminants.

## Reverse Osmosis

Reverse osmosis is a water filtering technique that sends tap water through a semipermeable membrane that stops the movement of particles larger than a water molecule. This technology can remove many contaminants that carbon and activated carbon cannot remove, such as arsenic, fluoride, hexavalent chromium, nitrates and perchlorate. But reverse osmosis is not capable of removing chlorine and VOCs. So, many reverse osmosis filters also often include a carbon-based component that can remove additional contaminants from water. **NOTE:**

**It should be noted that reverse osmosis filters tend to waste a lot of water—three to 20 times more water than they produce—so they should only be used to filter water used for drinking or cooking to prevent waste.**

Can remove: non-organic pollutants such as arsenic, fluoride, hexavalent chromium, nitrate, perchlorate.

Cannot remove: chlorine and VOCs.

## UV (ultraviolet)

UV filters use ultraviolet light—one component of sunlight—to kill bacteria and other microorganisms. They are not capable of removing chemical contaminants from water.

Can remove: microorganisms.

Cannot remove: chemical contaminants.

## Water softeners

Water softening is the most common type of ion-exchange filtering available. It's effective at reducing calcium and magnesium, minerals that can build up in plumbing and other fixtures, and also barium and other types of radium that sometimes can be found in tap water. But they cannot remove most other types of contaminants. Water softeners replace calcium and magnesium with sodium, so doctors tell some people with sodium concerns to avoid this technology. Softened water can damage plants and gardens, so for that purpose using regular tap water is advised.

Can remove: ionic contaminants such as minerals.

Cannot remove: any non-ionic chemical contaminants.



## Quick Guide: Water Filter Styles and What They Remove

	Chemical Contaminants	Chlorine	Inorganic Pollutants	Ion Contaminants	Micro-organisms	Mineral Salts	Organic Pollutants	Solids	Volatile Organic Compounds (VOCs)	1, 4-Dioxane
<i>Includes</i>			Arsenic, fluoride, hexavalent, chromium, nitrate, perchlorate	Minerals	Bacteria, viruses		Chlorine, asbestos, lead, mercury, VOCs	Sediment and cysts (e.g. Cryptosporidium or Giardia)		
Carbon/Activated		x					x		x	N/A (Currently under experimentation)
Carbon Block		x	x	x	x		x		x	N/A (Currently under experimentation)
Ceramic					x (not effective on viruses)			x		
Deionization				x		x				
Distillation	x		x	x	x	x				
Ion Exchange				x (Not effective on clay)		x				
Mechanical Filters				x (Dependent on location of use)		x	x (Dependent on location of use)			
Ozone			x	x	x	x	x	x		N/A (Currently under experimentation)
Reverse Osmosis			x	x		x	x			N/A (Currently under experimentation)
UV (Ultraviolet)					x					N/A (Currently under experimentation)
Water Softeners		x		x		x	x	x		

**For more information on healthy living,  
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