# Reducing PFAS in Your Drinking Water

## Introduction

Per- and polyfluoroalkyl substances, or **PFAS**, are a large group of man-made chemicals that have been used in many industrial processes and consumer products since they were developed in the 1950s. If an environmental contamination event occurs near your home, PFAS may end up in groundwater and place your drinking water at risk. This guide will help you learn about how you can protect your health by reducing the levels of PFAS in your home drinking water.

### PFAS can affect health.[1]

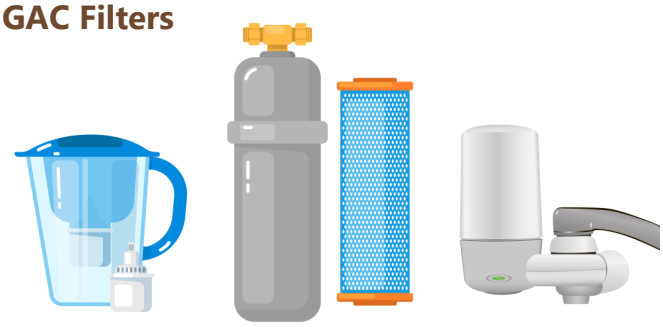
Exposure to unsafe levels of PFAS in drinking water may result in health effects including:

- Increased cholesterol.
- Decreased antibody response.
- Decreased fertility in women.

## Certified Technologies for Reducing PFAS in Home Drinking Water

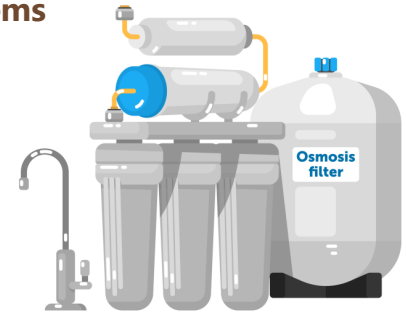
Certified treatment technologies for removing PFAS and other contaminants from drinking water include granular activated carbon (**GAC**) filters and reverse osmosis (**RO**) systems.

### GAC Filters



- In a GAC filter, water runs through small pieces of carbon that act like magnets. PFAS and other organic chemicals stick to the carbon as water passes through.
- Small-sized pitcher filters, refrigerator and faucet-mounted filters, and large whole-house treatment systems usually use GAC technology.

### RO Systems




- In a RO system, water is pushed through a filter membrane with small pores. The membrane acts like a wall that can stop PFAS and other chemicals from passing through.
- Residential RO systems are typically set up on a kitchen countertop or in a cabinet below a kitchen sink.

### What does "certified" mean?

Certification requires that products meet strict standards. Wisconsin residents are encouraged to select a product certified by the American National Standards Institute (ANSI) and the National Sanitation Foundation (NSF) or other ANSI-accredited third-party certifier. NSF is an independent, accredited organization that tests and certifies products to protect and improve human health. Products that meet ANSI/NSF Standards 53 and 58 are certified to reduce PFAS in drinking water.

Wisconsin Department of Health Services | Safety and Professional Services
For more information on PFAS and health, visit dhs.wi.gov and search "PFAS".
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## Consider Your Needs

The type of filtration device or system you may need will depend upon a variety of factors. This section highlights many of the important considerations you should make before deciding on a specific product.

### Is your drinking water at increased risk of PFAS contamination?

If you do not live near a site of environmental contamination, it is unlikely that PFAS are a problem in your drinking water. Residents who live near a site of PFAS contamination should connect with their local municipality and the Department of Natural Resources to learn about available resources for affected residents. To find out whether you live near a PFAS site, view this map.

**Private Well Owners**
The only way to know whether PFAS are a concern in your drinking water is to have a sample tested at a certified laboratory. This could cost several hundred dollars.

**Public Water Supply Users**
Connect with your local water utility to learn about what they may be doing to minimize PFAS. While some water utilities will voluntarily test for PFAS, they are not required to.

### Does your drinking water contain other contaminants?

The type of filtration device or system you may need will depend on the types of contaminants present in your water and their levels. PFAS are not the only potential contaminants in your drinking water. In Wisconsin, other common contaminants in groundwater include bacteria, nitrate, and arsenic.

**Private Well Owners**
Follow routine tests for bacteria and nitrate, and additional testing for other contaminants if indicated.

**Public Water Supply Users**
Contact your local water utility to learn more about the quality of your drinking water.

### Which water do you want to filter?

Are you looking to treat only the water you drink or prepare foods with (e.g., kitchen sink water), or also the water that you bathe in? If your water is only affected by PFAS, there likely isn't a need to treat all the water in your home with a point-of-entry (POE) system. POE systems are more important when contaminants may be harmful to touch or breathe in. PFAS do not present these concerns in residential settings and are therefore less important to treat for whole-house use.

### Point-of-use (POU) vs. point-of-entry (POE)

**Point-of-use (POU)** devices treat water from a single outlet, faucet, or fixture. Examples include pitcher, faucet-mounted, and refrigerator filters, as well as countertop RO systems like those pictured on Page 1. **Point-of-entry (POE)** systems, like the one to the left, treat all the water entering a house or a building. They are installed along the main water line that connects to a private well or municipal water supply.

## GAC vs. RO Systems: The Differences

| | Granular Activated Carbon (GAC)  | Reverse Osmosis (RO)  |
|---|---|---|
| **Which water can the system treat?** | GAC systems can treat water used in a pitcher or at a specific faucet (POU), or they can be used to treat water for an entire house (POE). | RO systems are generally used to treat water from a specific faucet (POU). Whole-house (POE) RO systems are available but less common. |
| **How costly is the system?** | Point-of-use devices like pitchers and faucet-mounted filters, as well as their replacement filter cartridges, are less expensive to purchase up front and replace than RO cartridges and membranes. GAC systems for whole house treatment can be more costly. | A RO system requires more frequent changes of filtration cartridges and RO membranes. In addition, it uses more water than a GAC system, which may increase your water bill. Depending on the quality of your incoming water, you may also need to purchase and maintain additional treatment devices such as a water softener or iron filter. |
| **What does the system remove?** | GAC systems can remove PFAS and other contaminants, but not nitrate, arsenic, manganese, or microbes like bacteria and viruses. They can, however, remove parasitic cysts like *Cryptosporidium* and *Giardia*, as well as undesirable taste and odor compounds. | RO systems remove more contaminants than GAC systems, including nitrate, arsenic, and may more efficiently remove PFAS[2]. While RO systems can remove parasitic cysts like *Cryptosporidium* and *Giardia*, they are not designed to routinely remove bacteria and viruses. |
| **What is the water flow?** | A GAC system provides less water flow than a standard water faucet, but greater flow than a RO system. | A RO system provides less water flow than both a standard water faucet and GAC system. |
| **How much water is wasted?** | GAC POU filters do not waste water. GAC POE systems require occasional backwashing to clean the system. | A residential RO system typically wastes 3 to 5 gallons of water for every gallon of water it treats. |
| **How does the system impact the environment?** | Captured contaminants stay in the GAC filter until the cartridge is discarded. Contaminated cartridges end up in landfills. | RO systems without a GAC component will concentrate PFAS in the untreated portion of water leaving the system, reintroducing contamination to the environment. |

No matter which system you choose, it will require regular maintenance. Follow manufacturer instructions for routinely replacing filter cartridges and RO membranes. Filters that have reached their capacity will no longer remove PFAS and other contaminants from your water.

## Recommendations

### Get a certified filter.

- For GAC systems, look for a product that is certified to ANSI/NSF Standard 53.
- For RO systems, look for a product that is certified to ANSI/NSF Standard 58.
- To find a product, view NSF's product certification listings or contact the NSF Consumer Affairs office at 1-800-673-8010 or info@nsf.org.

### RO systems should have a GAC component.

- RO systems without a GAC component can concentrate PFAS in the untreated portion of water leaving the system, reintroducing contamination to the environment.
- When selecting a certified RO system (ANSI/NSF Standard 58), look for an included GAC component certified to reduce PFAS (ANSI/NSF Standard 53).

### Find a properly licensed Wisconsin plumber.

- A reputable installer should be used to ensure proper selection, design, installation, operation, and maintenance of any larger filtration system.
- Verify a plumber's credentials by visiting the Wisconsin Department of Safety and Professional Services' License Look-Up.

### Proper maintenance is a must!

- Follow manufacturer instructions for routinely replacing filter cartridges and RO membranes.
- Use POU filters with cold water only. Running hot water through your POU filters may compromise filter components. If you need hot filtered water, first collect cold filtered water and then heat the filtered water separately. Boiling unfiltered water will not reduce PFAS and may actually concentrate them.[3]

### Did you know?

NSF standards certify that a filter can reduce levels of two well-studied PFAS compounds, PFOA and PFOS, to below the Environmental Protection Agency's health advisory level of 70 parts per trillion for combined PFOA and PFOS. However, studies have shown that NSF certified devices can remove a wide range of PFAS (not just PFOA and PFOS) to levels well below Wisconsin's recommended groundwater standards; these levels are very low and sometimes undetectable.[4,5]

## References


1. ATSDR. Perfluoroalkyls - ToxFAQs. https://www.atsdr.cdc.gov/toxfaqs/tfacts200.pdf. Published March 2018.
2. Herkert N, Merrill J, Peters C, Bollinger D, Zhang S, Hoffman K, Ferguson P, Knappe D, Stapleton, H. Assessing the Effectiveness of Point-of-Use Residential Drinking Water Filters for Perfluoroalkyl Substances (PFASs). *Environ Sci Technol Lett*. 2020;7(3):178-184.
3. USEPA. Drinking Water Health Advisory for Perfluorooctanoic Acid (PFOA). https://www.epa.gov/sites/production/files/2016-05/documents/pfoa_health_advisory_final_508.pdf. Published May 2016.
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5. Patterson C, Burkhardt J, Schupp D, Krishnan ER, Dyment S, Merritt S, Zintek L, Kleinmaier D. Effectiveness of point-of-use/point-of-entry systems to remove per- and polyfluoroalkyl substances from drinking water. *AWWA Wat Sci.* 2019;e1131.