Common Water Treatment Methods

Waterborne pathogens can't be tasted or smelled. They don't make water look dirty. But they can make people sick without notice. Unlike other water contaminants like iron, sulfur, and manganese, the presence of microbial contamination can change with melting snow, a heavy rain, land use, or a leaking septic system. That's why well water should be tested regularly—once a year at a minimum. And for peace of mind day to day, install a whole-home water treatment system.

Public health agencies recognize constant chlorination and ultraviolet (UV) light as two effective means of treating a water supply. So, how do you choose?

Want to add chemicals?

UV is a physical process that inactivates microorganisms with the light of a specific wavelength. No chemicals are added, so the water's taste or odor doesn't change. And, just as importantly, there's no need to handle noxious chemicals, monitor chemical levels, or worry about disinfection byproducts.

What microbes are in the water?

Some disease-causing organisms (*cryptosporidium* and *giardia*) are chlorine resistant. While more commonly introduced into surface water through animal feces, these microbes can wash into a well during a sudden thaw or torrential downpour. They can survive for long periods until they find a new host—like a person who drinks from a contaminated well. UV effectively inactivates these microbes, whereas chlorine does not.

What are the maintenance requirements?

UV system maintenance is as easy as changing the lamp annually and cleaning the quartz sleeve. Typically, these tasks take about an hour a year. If the water entering the UV system doesn't fully meet the manufacturer's specifications, the quartz sleeve may need to be cleaned every three to four months.

With a chlorinator, besides time spent refreshing and monitoring the chemical supply, the system should be thoroughly cleaned twice a year and given a complete inspection for any signs of corrosion.

Is space a consideration?

Chlorine requires at least 30 minutes to work, and because of that contact time, a holding tank is necessary for the more widely used chemical-feed chlorination systems.

Complete treatment with UV happens instantly, as the light passes through the chamber, so a UV system requires minimal space. Ideally, it's mounted on the wall where the water supply enters the home.

What is the budget?

Along with the UV system itself, some pretreatment will likely be needed. This could be as simple as a sediment filter or perhaps a carbon filter, which is often included as part of the UV system. If the water contains hardness minerals, it will likely require a water softener.

Despite what many people may think, UV systems are energy efficient. The energy consumption of a typical whole-home UV system is comparable to running a 40-watt light bulb.

Chlorine treatment requires a chemical feed pump, a solution tank, and, as previously mentioned, a holding tank with capacity that's based on the size of the home and water usage. For optimal performance, include a static mixer. By adding more chlorine, this setup can handle iron-containing waters, but an additional filtration step is required. A water softener is still required to treat hardness if that's an issue with the water. Adding a carbon filter will help remove the taste of chlorine from the water.

The pros and cons of the two treatment approaches

Treatment method	Benefits	Drawbacks	Maintenance
Ultraviolet light (UV)	• Does not require chemicals or produce disinfection byproducts • Installs easy • Is effective against common waterborne pathogens • Does not alter the water's taste or odor*	• Requires pretreatment (e.g., prefiltration for sediment and softeners in hard-water areas) • May require high UV doses to inactivate some viruses	• Replace the lamp annually • Occasionally clean or replace the quartz sleeve
Constant chlorination	• Reduces some disagreeable taste and odor • Provides residual disinfection • Can help remove iron and manganese from water	• Requires storage and use of noxious chemicals • Requires ongoing monitoring of chlorine levels • Does not work on chlorine-resistant microbes like *cryptosporidium* and *giardia* • May require a contact tank • Requires professional installation • Can alter the water's taste and odor • Is corrosive • Can produce harmful byproducts	• Check for loose, worn, missing, or broken parts • Clean the entire system semi-annually • Clean all surfaces showing corrosion • Refill chlorine supplies • Clean any clogged injection points

*In rare circumstances, low levels of sulfur in source water may become detectable due to the UV system.

VIQUA whole-home UV systems

One of the most recognized and respected names in residential and light commercial UV treatment, VIQUA point-of-entry systems reliably treat drinking water, protecting people from microbial contaminants. Learn more about the efficacy of VIQUA systems and why UV is the simple, effective water treatment solution at VIQUA.com.

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