

Residential UV: Pros and cons

Experts discuss the advantages of UV over traditional chemical disinfection methods.

Author: Nick Phillips, Assistant Editor

Studies show that one in four wells in the U.S. will test positive for coliform bacteria. This alarming statistic underscores the importance of proper disinfection and accurate, periodic water testing. Ultraviolet (UV) light has been used since the early 20th century to disinfect water, but increased consumer awareness about waterborne pathogens — such as *E. coli* and *Cryptosporidium* — has led to a rising demand for UV systems in private homes.

We recently spoke to two experts to find out why they believe UV is a superior disinfection method for residential applications.

Advantages

Unlike other disinfection methods, such as chlorination, UV does not require the use of potentially harmful chemicals. So while chemical disinfection opens consumers up to possible adverse effects from overtreatment, the potential for overtreatment with UV is virtually nonexistent.

“The nice thing about UV is that you’re not adding anything to the water, so you can’t really over-treat with ultraviolet,” says Bruce Eccleston, president of UV Superstore. “If you’re pumping a certain amount of chemical based upon a 100 gpm flow rate and you’re actually having 5 gpm going through there, that water [is] going to have an excessive amount of chemicals in there for what it needs.”

According to Steve Stone, North American sales manager for VIQUA, an additional benefit is that UV has no aesthetic effects on water. “UV does not contain any chemicals, so it doesn’t change the structure of the water,” he says. “But with chemicals, you’re adding something to your water and typically those chemicals will cause a change in the taste and odor. UV does none of that.”

Ease of maintenance is another area where UV holds a distinct advantage over its chemical competitors. If the proper pretreatment is employed — a sediment filter or reverse osmosis system, for example — UV systems only require users to replace the lamp once per year. “If I was putting in a system, I’d much rather have a UV,” Eccleston comments. “If you have the proper pretreatment, you don’t have to touch [a newly installed UV system] until the next year. It’s as simple as that.”

Disadvantages

While UV is much more effective at reducing coliform bacteria and cysts, it is not the right treatment for every application. For example, UV light is not as effective on water that has high levels of tannins, such as that found in Florida.

Furthermore, explains Eccleston, areas with extremely hard water are not ideal for UV systems. A UV lamp is enclosed in a protective quartz sleeve, but if scale builds up on the sleeve it can have a negative effect on the lamp's ability to disinfect. "If your quartz sleeve gets any buildup or biofouling on there — maybe you have really hard water and you get a scale that starts building up on the quartz sleeve — the UV light can't penetrate through it to disinfect the water properly," he says. However, he adds, scaling can be minimized if the proper pretreatment is employed.

Even if a customer does not have hard water, the quartz sleeve should still be checked from time to time to make sure it's clean. "[We tell new users] to check the sleeve after a month and clean it and if it's not very dirty maybe wait two months before they check it again," says Stone. "And pretty soon, they'll know how often they need to check it and clean it."

Consumer education

While ultraviolet (UV) disinfection systems are quite common in Canada, well owners in the U.S. need to be better educated on the necessity for disinfection. "In Canada, when they drill a well, it's almost always a given that the consumer understands that they're going to need some form of protection on their well. And, typically, that protection is UV," explains Stone. "In the U.S., the consumer is not educated to the point to where they understand the need for disinfection." And, according to Stone, one piece of evidence indicating the lack of consumer knowledge on the subject is the fact that the UV industry's biggest competitor is not chlorine or ozone, it's a well-known bleach product.

"When somebody gets a bad water test, they [might be] told to go dump a couple gallons of Clorox[®] into their well and have it tested again," Stone explains. "Then the test comes back good and the homeowner thinks they're safe, but what they don't realize is that once the residual is gone they're still drinking bad water."

Stone emphasizes that water treatment dealers, plumbers and drillers need to help customers understand the importance of well testing and make them aware that quick fix, "band-aid" solutions are not in their best interest. "UV is a pretty inexpensive insurance policy to know that you will never have unsafe drinking water in your house. It's all about education," he concludes.