

UV disinfection

UV disinfection has been used in water treatment since the late 1970s and is a cost effective, reliable way to kill virtually all waterborne microorganisms. To disinfect water, UV systems use a specialized lamp. It's convenient, environmentally friendly and provides a whole-house solution for all residential needs -- drinking water, personal hygiene, cooking and other uses. The taste of water isn't affected, and there are no harmful by-products created. Maintenance generally requires only an annual lamp replacement and sleeve cleaning.

Bottle Water

Bottled water is not a treatment option but rather an option to treatment, in that some people consider buying it an acceptable way of dealing with bad or suspect water. It's convenient in some ways and not in others. Bottles can be purchased at any local grocer; however, they must be carted home and eventually recycled. Bottled water is, of course, often delivered. The two most important reasons why people on private water supplies concerned about safety might choose bottled water are ease of decision-making (no need to learn about equipment), and a low initial investment. While the low upfront cost of bottled water is an important driver, the cumulative cost can be high. Indeed, Americans spent almost \$6.5 billion on bottled water in 2001, according to Beverages Marketing Corp.'s recent report, *Bottled Water in the U.S.* Finally, bottled water isn't a whole-house solution, though some people have been known to put bottled water in every room of the house.

Chlorinators

Chlorinators add chlorine to water stored in a tank, allowing sufficient contact time to kill harmful microorganisms. These systems require regular purchase and handling of chemicals, and they can be prone to maintenance issues. Chlorine is effective against most bacteria and viruses, but not against *Cryptosporidium*. This is an important consideration since it was this parasite that recently caused widespread illness amount 14,000 people in North Battleford, Saskatchewan, and the death of 104 people in Milwaukee in 1993. It also is susceptible to certain potentially cancer-causing disinfection by-products (DBPs) in waters containing organics, notably trihalomethanes (THMs) and haloacetic acids (HAAs).

Ozone Generators

Ozonation like UV is a very effective disinfectant. Ozone can be problematic, however, because while it has a short half-life, it can be a volatile chemical and should be closely monitored. Most often it's used in municipal and commercial/industrial applications, although a few practical residential systems have been developed. Like chlorine, it also has a DBP-bromate-in waters containing the bromide ion.

Filters

Filters vary widely in cost and performance. Most aren't very expensive and are easy to install, but they aren't effective against many waterborne microorganisms. These filters are meant to remove sediment, taste and odor from the water. They may remove pathogens, although they aren't designed to remove sufficient numbers of them (typically a 99.99 percent or 4-log reduction is sought with any disinfection system). Filters may also treat water for the entire household.

Distillers

Distillers represent a way of boiling water and removing unwanted contaminants more efficiently and conveniently than you can in a pot on the stove. They are nonetheless energy intensive, and don't provide water that's immediately consumable (i.e., cold). They aren't a whole-house solution.

Boiling water

Boiling water is an option with almost no upfront cost, though the energy use does add up. More importantly, boiling water is very labor intensive and inconvenient in that it doesn't produce immediately consumable water. It can also concentrate rather than remove some volatile contaminants. Like distillers, boiling water isn't a whole-house solution.

Opportunities everywhere

Consumer awareness is increasing. The number of water tests performed is growing, and there are more and more people taking preventative measures. Still, consumer behavior sometimes needs encouragement. It's not that people don't care enough for their families. The flaws in their knowledge or reasoning must simply be addressed. They must understand the dangers and realize that, without proactive measures, their safety may not be assured. This doesn't necessarily need to be done through a sales pitch that focuses on fear -- but rather one that stresses the positive health benefits of treated water. One should keep in mind also that combining technologies mentioned above offers a more pragmatic, multi-barrier solution to water treatment than any one individually. And adding UV to the mix offers even more assurance. In fact, UV (like RO) typically includes pre-filtration making the complete package a multi-barrier solution.

Conclusion

In the end, every customer on a private water supply should take steps to assure their supply is safe at all times. Many of these customers are already in the marketplace, buying filters, softeners, salt, pumps and other pieces of equipment and supplies. A well-trained representative should be able to succinctly deliver the message that there is reason for concern and that reacting to an incident after the fact isn't worth the risk, especially given the affordability and convenience of some available options. In many ways, the most effective, convenient and affordable of these disinfection options is a UV system.
