



Bottle sanitizing with ozone

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Bottled Water Business

A second generator dedicated to bottle rinsing offers reliability and safety.

by: Debra Gorgos, Associate Editor

Many bottled water plants use ozone in their bottling process for sanitizing. Typically, bottlers use a side-stream of process water for their sanitary rinse, but will elevate the ozone because they're typically running between 0.2 parts per million (ppm) and 0.4 ppm in product water.

Application Engineer Kevin Clute, with Guardian Manufacturing, a company based in Cocoa, FL, that designs ozone integrated systems, says ozone levels have to be elevated when it comes to the sanitizing bottle rinse.

Noting the exception of caution needed for situations involving bromide in source water (sidebar), "Ozone levels must be elevated when it comes to the sanitizing rinse, and one of the issues with using ... [an] ozone generator is control," Clute says.

Questions on automation

Most bottled water plants today have in place automated systems, including dissolved-ozone monitors, which communicate with the ozone generator to control ozone output as water flow and demands change. With a properly sized ozone generator, after the initial ozonation process of a product tank is satisfied, the generator should only operate as demand requires and stop producing ozone if there is no demand.

But Clute asks: What happens when the an ozone generator has stopped producing ozone for product-water disinfection but the process line continues rinsing bottles? The result, he says, is that bottles would not be properly sanitized.

Some operators believe that because there is one generator for product water, they can "tee" into the line from that generator, tapping it for ozone for bottle rinsing.

"But it's not that simple," Clute says. There is no simple way for controlling one generator to stay on for rinsing. If the generator remains on for the purpose of sanitizing bottles, he says, you must have flow meters and solenoid valves fully integrated to completely control ozone output between the tank and sanitizing rinse line.

"The best scenario for the sanitizing rinse in a bottle line is to have a separate generator for that purpose alone," he concludes.

Separate ozone for rinsing

An ozone generator's cost will depend on line size and is generally \$5,000 to \$20,000 for a properly sized injection system for sanitizing bottles.

"Companies must get past the point of the initial cost. Buying another generator is worth it in the long run," says Clute.

Clute is partial to ozone. "In this industry, I compete against alternative sanitizing chemicals such as chlorine quite often," he says. Although using chemicals to sanitize bottles is rather inexpensive to set up and operate, he notes that companies will have the expense of purchasing chemicals every month. He says ozone is more powerful than traditional chemicals "hands down," and he calls it a "green" technology because it leaves no waste or residue.

Remember ozone safety

Customers must understand how much ozone is going into bottle-rinsing, with a full understanding of the ozone contact process, according to Clute.

When ozone is dissolved in water, its solubility is greater than that of oxygen, Clute says. But unless you have an efficient mass transfer method in place, you might only get 60 to 80 percent efficiency in the dissolving process. The other 20 to 40 percent of raw ozone gas that doesn't dissolve is in a gaseous form and can become hazardous to the health of anyone exposed.

Having proper devices such as an ozone destruct unit on contact tanks and controlling offgas emissions from the sanitizing rinse section of the bottling line is a must. Ambient air monitors to ensure employee safety should be considered. "Working with ozone should not be taken lightly when it comes to employee safety," Clute says.

Turnkey systems

Clute strongly urges having a generator properly sized by a consultant or expert. Bottlers often cannot simply buy an ozone generator and injector, self-install them and expect everything to work, he believes.

Companies serving the bottled water industry have turnkey ozone contacting systems complete with dissolving chambers, degas separators and ozone-destruct mechanisms that achieve mass transfers of greater than 95 percent efficiencies. Most come with or offer dissolved-ozone monitoring devices along with on-board ambient air monitors.

Clute believes that while having an efficient, safe ozonation system for bottle rinsing can require some research and upfront cost, it's well worth considering in terms of long-term cost savings and bottling production safety and efficiency.