



Choosing the Right Bottle Washers and Fillers

for Your Large-Bottle (Three- to Five-Gallon) Business

This article provides some direction to help start-up or expanding bottled water operations make intelligent equipment choices. It goes without saying that selection of a reputable source of equipment is mandatory. Better yet, find a company that offers quality equipment and is also capable of providing sound pre-sale business advice as well as after-sale support.

Bottled water companies build their success on the quality of water they produce and distribute. Key factors in the quality equation are bottle washing/sanitizing equipment and reliable bottle fillers.

Water bottlers must meet federal, local and industry regulations in the bottling process to ensure the quality of their products and the health of their customers. In this article, we use standards that are generally accepted throughout the industry and by federal governmental agencies. Some variations may exist from state to state.

Bottling production lines for large bottles (three-gallon to five-gallon) must be located within 'clean rooms' which are atmosphere-controlled rooms that eliminate dust, insects and bacteria from the

areas in which bottles are washed, filled and capped. Some high-performance bottle washer/filler units are self-contained clean rooms that isolate the bottle-washing process from airborne dust or bacteria that may be present.

The bottle-washing process

Empty bottles are vulnerable to a variety of airborne contaminants throughout the manufacturing process, from the instant they exit the blow molder until the time they are filled with product water.

For that reason, proper bottle washing, sanitizing and rinsing is critical to running a quality bottling operation that is in full compliance with FDA and industry standards. The best washer for your bottled water plant will combine efficiency, precision control and easy-to-clean design features to ensure proper operation for profitable bottling.

By Bruce Kucera

The wash/rinse cycle

Two basic reasons for bottle washing exist: the first is that ambient dust and bacteria may collect on bottles from the time they are manufactured until the time they are filled. Second, bottles commonly used for home and office coolers are often re-used by the water distribution company. Used bottles are also subject to contamination by airborne particles.

The washing cycle must be stringent enough to eliminate any possible contaminants to which the bottles may be exposed on location. Bottled water operations, according to generally accepted standards for washing and rinsing polycarbonate bottles, require bottle surfaces to be in direct contact with the water and cleansing agent solution at a minimum of 120 degrees for at least one minute. A variety of cleansing agents, including chlorine, may be used (or required) depending on plant location. Many bottle washers utilize a 2.5 percent caustic solution of an approved cleansing agent for polycarbonate bottles. It is best to research and purchase the correct solution for polycarbonate bottles to prevent 'cracking' of the bottles and to extend bottle life.

The sanitizing cycle generally requires exposure of all bottle surfaces to a sanitizing agent solution (of a recommended type) for at least 45 to 60 seconds. Many bottled water operations use a chlorine solution or a hyperoxygenated water rinse. The bottle is then given a final internal rinse to wash away any remnants of detergents or sanitizing solutions that may still be inside the bottle.

With the completion of the final rinse cycle, the thoroughly washed and rinsed bottles move on to the filling phase of the bottling operation.

Equipment selection

There are several primary factors bottling operations should consider when shopping for a bottle washer.

- Select a washer that fits your plant's production requirements. You can choose from manual and semi-automatic models that wash 50 bottles an hour, one or two at a time. Plants with higher volume requirements can choose from a variety of fully automatic washers that can handle 900 bottles (or more) an hour.

- Opt for a washer that integrates well with the rest of your bottle-filling production line. It is best to buy a production line from a single source, to en-

sure that the equipment has been designed and manufactured to function as an integrated whole. Additionally, in the case of equipment malfunction, it is easier if you have to deal with only one source to solve problems.

- Choose a washer with precision electronic controls. It is vitally important to ensure that you can monitor water temperature, solution concentrations and timing to ensure compliance with industry sanitizing standards.

- Washers manufactured from stainless steel are designed for easy cleaning.

- Look for a washer that is designed for efficient recycling of rinse and product water. A well-designed unit will use no more than one liter of wash/rinse water per bottle. Thoroughly investigate the amount of water discharged during the entire process. In particular, look for systems that use final product water/rinse water to supply wash and sanitizer tanks. This will minimize water waste and will help to conserve both detergent and sanitizer fluids.

Choosing a bottle filler

The most important consideration when it comes to choosing a bottle filler is the unit's production rate. This rate must be consistent with the requirements

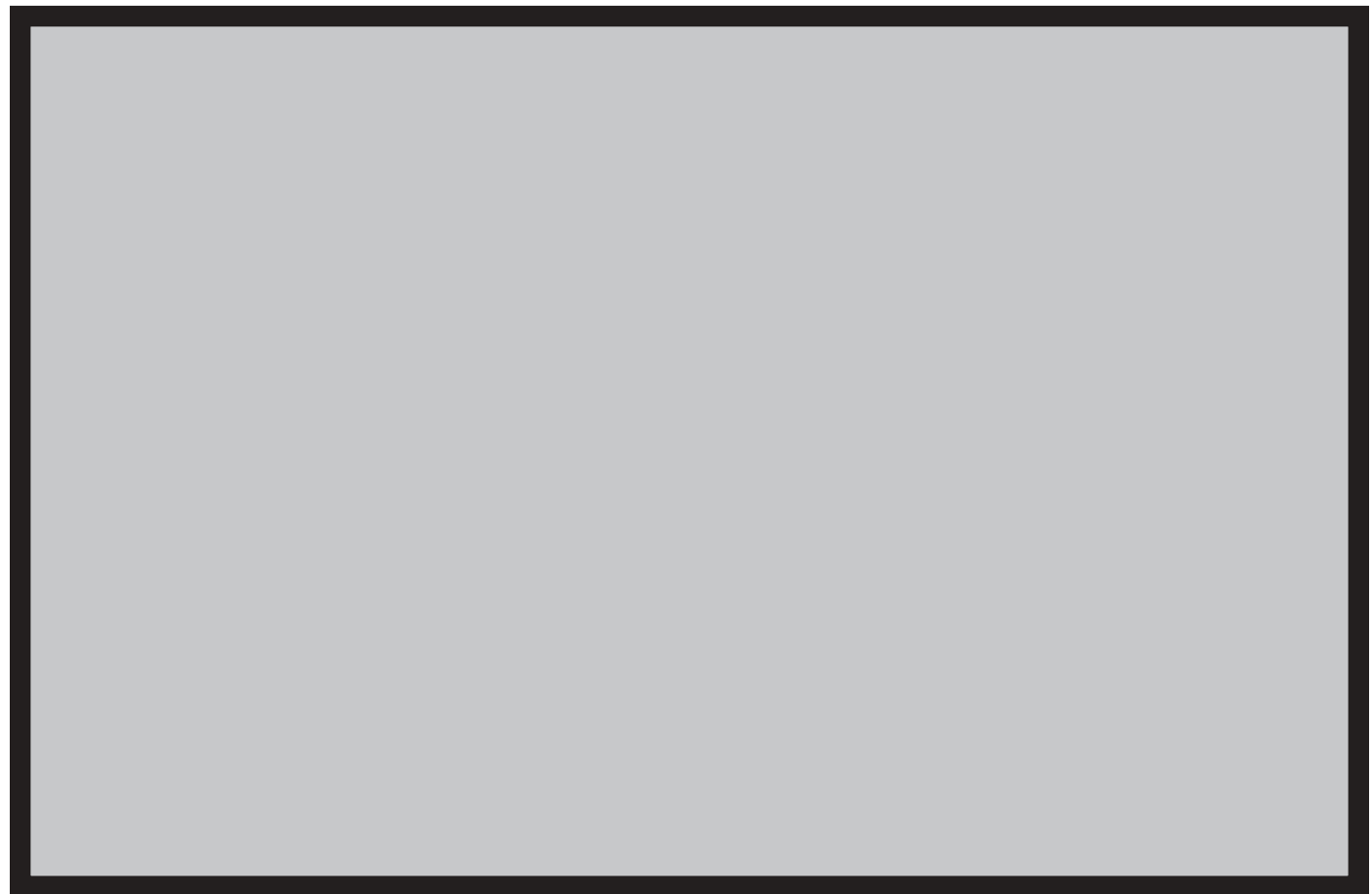
of your business at start-up or in the foreseeable future. You don't want to be under-equipped, making it difficult to serve your clientele well.

There are three basic types of fillers currently available on the market: manual, semi-automatic and automatic.

Manually operated fillers

Start-up businesses with limited capital (or companies that simply want to add bottled water as an extension to their product line) often choose the simplest, least expensive equipment. This allows them to test the market and determine demand for products in their operating areas with a minimal investment.

Manually operated fillers typically handle up to 60 bottles an hour and require one operator. The best fillers are simple to use: the operator places the washed bottle directly under the fill head, then opens the ball valve to initiate the filling process. When completed, the operator simply closes the ball valve. Some also come with a cap applicator to finish the process. The best of these machines are constructed of stainless steel for durability as well as for ease of maintenance and cleaning, which contributes to general plant sanitation and water quality.



Semi-automatic fillers

For larger start-up companies that need to produce a higher volume of bottled water, there are a variety of semi-automatic fillers available that can process several bottles at a time. Several important factors should be considered.

High on the list, of course, is choosing the filler that best meets your business's needs for the foreseeable future to meet your customer demands. Other important considerations include:

- Capability to handle different sized bottles. Some units are available with adapter kits that permit switching from processing three- and five-gallon bottles to bottles as small as 12-ounce. This versatility can provide opportunities to expand product offerings, thereby increasing profits.

- Ease of operation. The best-designed fillers don't require highly trained operators. Look for a filler that is well-designed, including automatically controlled filling to ensure volume and nozzle height. This control will minimize wasted water and provide a consistent level of water in each filled bottle. Some semi-automatic fillers include a manual cap chute and cap press system.

- Adjustable filling table height. You will want a filler that can be adjusted

easily to work well with a variety of the available conveyors on the market.

- Simplicity of design. The simpler the filler is designed and manufactured, the easier it is to operate and maintain. This generally will result in longer service life and less hands-on time.

- Quality construction. Choose equipment made of stainless steel and other food-grade-approved materials that are ozone-resistant, to help meet state and federal requirements.

Automatic fillers

Automatic fillers are designed generally for larger operations that require a significantly higher quantity of filled bottles per day. Again, selection should be consistent with a realistic assessment of volume of business projected. Some equipment can produce 1,000 or more large bottles an hour. If you are planning to include a higher volume automatic filler, you should probably consider a self-contained production unit that includes a washer, filler and capper.

Again, it is best to acquire all elements of your production line from one manufacturer to ensure maximum component compatibility for production efficiency. The more automatic the system, the fewer the personnel required to op-

erate that system. The best large automatic systems can be handled by one or two operators.

Look for these additional features in an automatic filler:

- Adequate speed and capacity for your needs.

- Built-in product water supply tanks of stainless steel.

- A unit that does not recycle unused or spilled filler water back to the supply tank, thereby eliminating the possibility of product contamination.

- The best units will feature a 'lift and hold' function during the filling process which minimizes wear on bottle bottoms and increases their service life.

- Stainless steel construction. This is a must to minimize maintenance, increase effective sanitation and provide longer service life.

- An effective clean room environment. Higher quality automatic filler lines will provide clean, pressurized filtered air chambers as an integral part of the equipment. If not, the entire operation must be housed in a clean room with a controlled, filtered ambient atmosphere.

- Automatic fill levels for consistently uniform bottle fill levels.

- A versatile capper system must be able to accommodate a range of bottle sizes.

Summary

Proper bottle washing, sanitizing, rinsing and filling are critical to running a quality bottling operation that is in full compliance with FDA and industry standards.

Your production line must meet these requirements. Choose your equipment carefully with an eye toward the volume demands of your business for the foreseeable future. Of course, it will help to have confidence in your equipment supplier, to ensure you are obtaining quality equipment and after-sale support.

About the author

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