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2019 LAB GLASSWARE WASHERS RESOURCE GUIDE

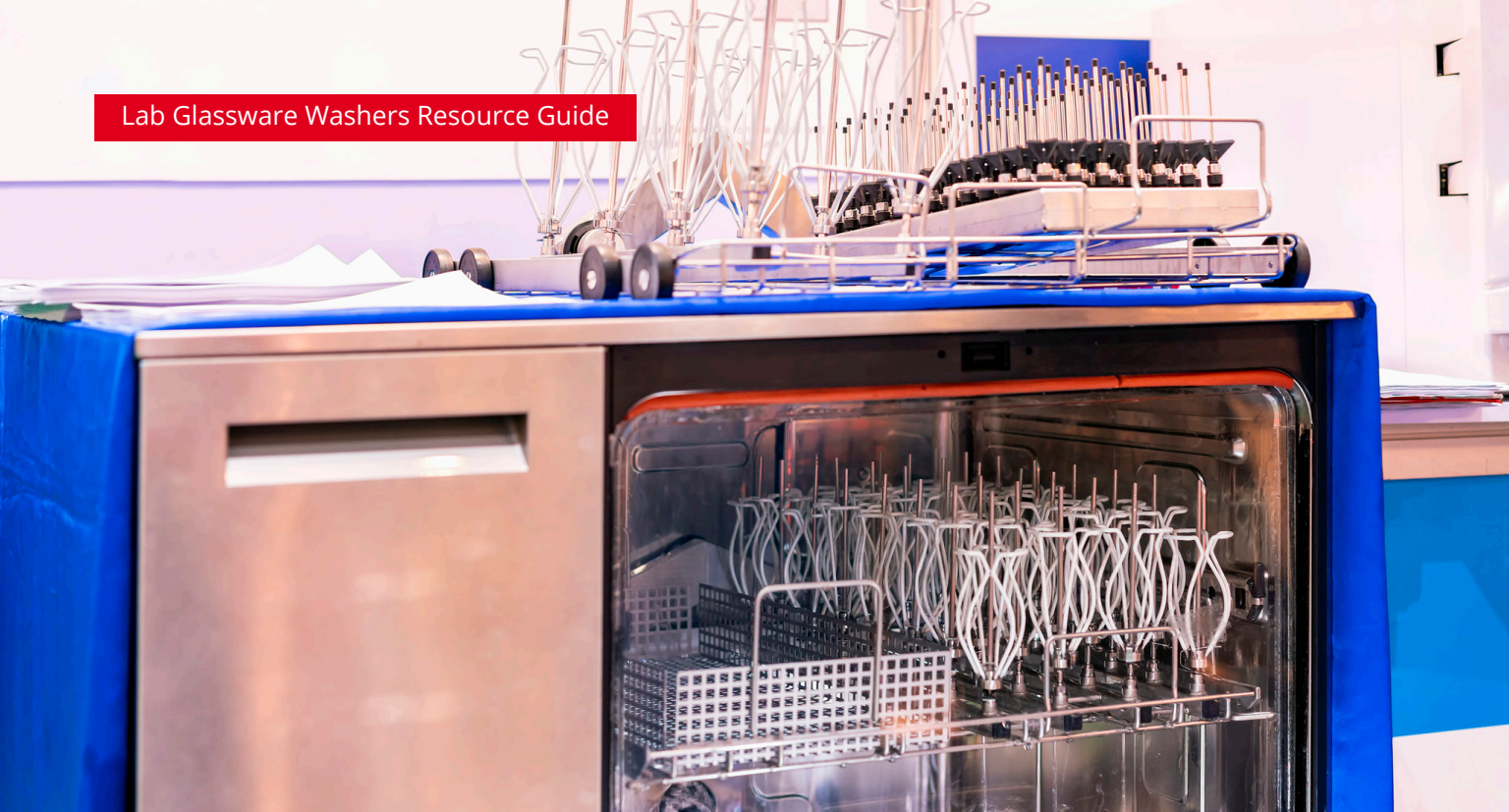
Questions to Ask When Buying a Lab Glassware Washer

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Questions to Ask When Buying a Lab Glassware Washer

By Lab Manager

How much glassware will I be washing?

Glassware washers come in a variety of configurations and sizes. For instance, if the amount of glassware to be washed is minimal, then an under-counter, standard capacity washer is ideal and will also free up valuable floor space. Alternatively, if sample throughput is high, bringing with it an increased amount of glassware to be washed, then a large capacity floor-standing washer may be needed.

Am I using the glassware for sensitive analyses?

If the glassware is going to be used for preparation of samples that will be run on highly sensitive equipment (such as mass spectrometers), then some additions may be required in order

to ensure contamination does not occur. Many companies make glassware washers tailored to such processes. These systems involve high purity water, high temperatures, and forced air drying using HEPA filters to ensure airborne particles do not cause an issue. Many of these systems also include the ability to print out the settings used to wash the glassware, ensuring the proper settings were used for the process.

How quickly do I need the glassware to be washed?

Depending on the process and deadlines of the laboratory, different drying methods can be utilized to ensure quick turnaround of glassware. Traditionally, gravity convection drying elements are used in glassware washing systems, which can consume more energy to heat the elements than current models. Newer models use HEPA filtered forced air to dry glassware. On top of increasing throughput, HEPA filtered forced air will also ensure no airborne contaminants compromise glassware cleanliness.

SAFETY TIP

Broken glassware can present a hazard not only to lab staff, but to your glassware washer as well. To avoid breakage, all glassware should be inspected for cracks and contamination before use. Cracked items should be disposed of, and contaminated glassware should be cleaned. If an accident does happen, broken and other waste glass should be discarded in a container specially marked to indicate its contents. This is so that housekeeping and other personnel will exercise due caution when handling it.

The Benefits of Machine-Washing Your Laboratory Glassware

Laboratory glassware washers offer numerous advantages when used right

By Erica Tennenhouse

Laboratory glassware can be washed by hand or machine. While machine-washing offers numerous benefits, it is only effective when done properly. Nonetheless, even as manual cleaning of glassware becomes less and less common in the lab, there are certain situations in which it is still useful.

One of the major benefits of machine-washing is reproducibility. Washing all glassware with the same machine eliminates variability in the washing process. An automated washing process allows laboratories to easily implement standard operating procedures that can be followed by any given user.

Machine-washing is often a more effective means of cleaning than handwashing. Washing with a lab washer allows hotter water and stronger cleaning agents to be used, giving a much more intensive wash. Reports have even demonstrated that glassware washers are effective for residues that scientists sometimes assume require handwashing.

The lack of human contact with potentially harmful substances is another advantage of machine-washing, increasing the safety of your laboratory workers.

Importantly, automating the washing of glassware streamlines the process and frees up technicians to perform other tasks, which serves to increase overall laboratory productivity. Although a laboratory glassware washer is a substantial capital expenditure, the labor reduction afforded by the automation means most laboratories will quickly get a return on their investment.

Still, there are times when washing laboratory glassware by hand might be desirable. For example, certain types of glassware are more susceptible to being bleached or dissolved; these issues are less likely to arise with handwashing. Additionally, more mechanisms of action can be used to remove residuals when washing by hand. Larger glassware pieces, which might not fit in a typical under-counter laboratory glassware washer, may also require handwashing.

While there are many advantages to washing laboratory glassware by machine, steps must still be taken to ensure an effective wash. Here are some best practices for machine-washing your laboratory glassware:

- *Know your residues.* Certain glassware residues are soluble in a basic detergent, while others require a more acidic detergent. Combining a basic wash with an acid rinse can provide the best of both worlds.
- *Orient glassware in the washer at an angle.* If a graduated cylinder is placed vertically, water can pool on the top and dry, leaving residues behind. Placing that cylinder at a slight angle will ensure the water comes off.
- *Make sure glassware pieces are not touching, and do not overload the washer.* Sufficiently spacing out glassware enables water and detergent to reach each piece.
- *Get the temperature right.* For sensitive glassware, such as pieces made out of soda-lime glass, the rate at which glassware dissolves increases with increasing temperature.
- *Provide sufficient rinse times.* If rinse times are too short, residuals may not get completely washed away and re-deposition can occur.



Get Your Labware “Cleaner than Clean”!

By Angelo DePalma

“Cleaner than clean” sounds like a slogan for laundry detergent, but analytical chemists know that even the slightest contaminant can ruin an inorganic analysis. Similarly, biochemists understand how trace metals can knock out enzymes and oils can swamp liquid chromatography signals.

Numerous websites offer tips on hand-cleaning glassware as a stand-alone operation followed by autoclaving, or as a prelude to automated washing and drying.

For example, glassware can be conditioned before use with a mild hydrochloric or nitric acid wash, followed by a deionized water rinse. You should avoid soaking glassware for a long time in a strong alkaline solution because a strong base eventually etches the glass. Greasy residues can be removed with a solvent or with a chromic acid bath. Users should follow up with a standard automated washing cycle with a suitable detergent to remove trace residues and ensure complete drying.

Oily residues

The procedure for removing oils varies depending on the nature of the oil. Where petroleum products may be aggressive to lab washer components, the rule of thumb is to clean the glassware as well as possible before placing it into the washer.

Stuck-on material should be removed using a towel or wipe before washing. Multiple prewashes can also be used with an emulsifier to get as much oil off the glassware and down the drain as rapidly as possible.

For residue-free cleaning once the glassware is in the machine, consider a wash program consisting of prewashes and multiple rinses of deionized water, including a heated final rinse and high wash temperatures of 80°C to 85°C for both the wash and final rinse temperature. Once glassware is removed, store it in a dust-free, dry environment protected from the outside air. Flask and beaker openings may be covered or capped for protection from dust and laboratory fumes.

Once labware is ready for the washer, residual oils are eliminated through judicious selection of detergent and predefined cleaning protocols, which differ according to how the glassware had been previously used and its future intended use.

Purchasing tips

Often, labs define their own approaches to “cleaner than clean.” Many labs have SOPs for their specific cleaning needs. With automated washers, these programs can be stored in the machine itself.

Additional considerations should be made when selecting a labware washer for your lab:

- **Energy Consumption:** Lab washers can be energy hogs. Consider running the cycle overnight when electricity rates are lower. To conserve water and electricity, make sure the washer is full before turning it on.
- **Low-Residue Performance:** If the cleanest possible labware is your goal, look into EPA Methods 200.7, 524.2, 525.1 and 8270, which are used to test for the most common post-washing residues. Then ask the washer manufacturer for its unit’s standardized residue data.
- **Flexibility and Durability:** Lab washers should accommodate all your most-used labware, resist possible contaminants, and last for years.
- **Validity:** Laboratories may need to validate their washer’s performance with respect to cycle duration, wash temperature, and drying. This can be achieved through a direct RS232 port that connects the washer to a computer logging system.

Can You Clean Plastics in a Glassware Washer?

By Lisa Choplo, Miele Professional Laboratory Applications Manager

Lab glassware washers offer an excellent solution for laboratories that need to clean dirty labware including beakers, test tubes, Erlenmeyer flasks, cylinders, and BOD bottles. Technicians may be unsure whether dirty plasticware can also be cleaned in a glassware washer, leading them to hand wash the equipment which can be extremely time consuming.

Will plastic containers fall off the injectors during the cleaning cycle?

Plastic containers typically will not fall off injectors during a cleaning cycle as well-designed glassware washers have water coming from multiple directions to balance out the force. This balance keeps plastics in place on the injectors and eliminates excess movement. If in doubt, or when cleaning very small lightweight items, an overlay can be placed on the items being cleaned to hold them in place.

I'm worried about plastic containers melting in the glassware washer. Are there temperature guidelines?

The type of polymer that comprises the plastic determines the physical properties, such as the melting point and deformation temperature. This information can be easily found to determine the optimal wash temperature for the polymer being cleaned.

Users are encouraged to read the product literature and check the plasticware for temperature resistance before washing plastics for the first time to set the proper temperature. In fact, many washers are pre-programmed with a wash cycle to clean plasticware at lower wash temperatures.

Generally, if the manufacturer's instructions state "unable to autoclave," the washer should be adjusted to a lower temperature to avoid plastics melting. A glassware washer provider should be able to provide application support and assist in the machine's programming to avoid melting or distortion.

Are there any drawbacks to washing plastics in a glassware washer?

Yes. Plastics usually will not come out bone dry when cleaned in a glassware washer, or any other automated washing device, and users must tailor their expectations. There is also a chance of plastics discoloring. However, the benefits of having an automated process, specifically a glassware washer to provide clean containers for testing, analytics, and research typically outweigh the drawbacks of discolored plastic.

What about disposable plastics?

Glassware washers can also clean disposable plastics such as beakers, bottles, or vials. By washing disposables just once, laboratories can cut waste by 50%, saving money and providing a better environmental solution.

Are there any other benefits to using a glassware washer?

By using a glassware washer, laboratory staff will feel confident knowing their plasticware is being cleaned effectively. Hand washing plastic can be unreliable, and staff won't be able to determine if plastics have achieved a validated clean. Washers can be programmed to meet wash parameters for critically clean results, whether cleaning glass or plastics, a factor that is beyond human control.



Maintenance Matters: Lab Washers

By Rachel Muenz

For something so instrumental to keeping glassware clean, it only makes sense that maintaining the cleanliness of your lab washer is one of the keys to keeping it running properly

Cleaning a cleaning machine

The key to maintaining a glassware washer is keeping the inside clean. This includes the filter screen, which should be cleaned to remove any debris that's collected or anything that's falling off. If the screen is not clean, it could cause problems for the pump. The tank itself should also be cleaned.

Always consult the operating manual before using your glassware washer. You should also make sure you are using the proper chemistry or detergent for your application as different detergents are used to wash items that are soiled differently. Using the right detergent will help get the glassware clean while preventing problems.

You should also use the right amount of detergent. Adding too much detergent can end up leaving residue on glassware, as well as on the tank. In this case the “more is better” mentality may backfire, and you may end up with spots and white film on your glassware. Users can avoid this mistake simply by reading their manual, taking into account the hardness of their water and their application, and getting help from their manufacturer.

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Using in-house personnel or outside contractors who don't have the proper training to do advanced work on the machine is another common mistake in the lab washer world.

Experts recommend talking to the manufacturer to get maintenance advice along with only using OEM parts to service the machine and ensuring the product's safety and operating guidelines are followed.

Each manufacturer also has its own recommendations for how often users should do maintenance on their machines. Generally, if you are using your machine four to six times a day, one preventive maintenance a year is sufficient. However, if the machine is being run for more than an eight-hour span, the machine should be serviced every six months. Preventive maintenance should also be performed if you are washing petroleum, oils, perfumes, or any glassware that is coated with solvents.

While some vendors offer service plans of various levels with their washers, not all do, as most of the maintenance can be done by the user.

BENEFITS OF A MAINTENANCE PLAN:

- Specific inspection, maintenance and servicing guarantees full machine performance and machine uptime
- Reduced downtimes and avoidance of unnecessary repairs
- Increased productivity and uptimeSafeguarding of investments
- Comprehensive information on technical condition of machines

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