



BIOSAFETY TIP OF THE MONTH:

Vacuum Traps for Biohazardous Waste

It's easy to overlook some important details - please check your setup!

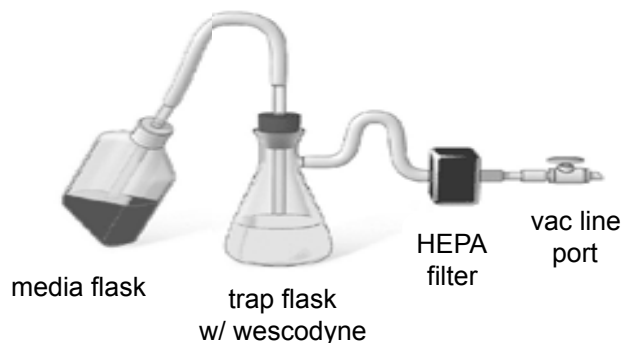


OVERVIEW

The culturing and preparation of cells or tissues generates liquid wastes that must be managed according to the biological, chemical, and radiological hazards they contain. Potentially infectious cell or tissue culture waste media constitutes a biological waste that **must** be disinfected prior to disposal.

The Centers for Disease Control & Prevention (CDC) and National Institutes of Health (NIH) recommend that the vacuum systems used to aspirate these wastes are protected with High Efficiency Particulate Air (HEPA) filters and liquid disinfectant traps to prevent aerosolized microorganisms from being emitted into the laboratory or the system exhaust. The HEPA filter, installed inline, will isolate and confine infectious materials and prevent aerosol contamination of the vacuum pumps (see Figure 1).

FIGURE 1. Basic Concept



Adapted from CDC/NIH Biosafety in Microbiological and Biomedical Laboratories. 5th ed. (2007), Appendix A.

PROCEDURE

ALL vacuum lines must be protected using in-line vacuum filters and vacuum traps. These disposable filters are available through the Dartmouth Scientific Stockrooms.

1. **ASSEMBLY:** See **Figure 2** for an illustration of a proper assembly.

Part a. Vacuum line from the media to the flask trap: A thick-walled tube is connected to the top of the vacuum flask via a rubber stopper with a plastic disposable 5 or 10mL pipette inserted in the middle of the stopper. The working end of this tubing is connected to a disposable 5 or 10mL pipette, which is then used to aspirate media or other biohazardous liquid waste. Often, a p1000 pipet tip is used over the plastic pipette and changed to maintain sterility between samples.

Part b. Vacuum line from the flask trap to the house vac: A thick-walled tube connects the vacuum line port to an inline HEPA filter. A short length of thick-walled tubing connects the HEPA filter to the side port of the vacuum flask.

2. **ADD DISINFECTANT:** The vacuum trap flask must contain an appropriate disinfectant, such as wescodyne, which is effective as a 0.5% solution (2.5mL per 500mL) and is stable for a few months. The waste must be removed whenever $\frac{1}{2}$ the volume of the flask is reached. If using wescodyne, then waste disposal every 3 months is acceptable if the trap not actively used. Add additional volume of disinfectant if needed to achieve proper concentration before disposal. Mix waste and disinfectant and let sit for a minimum of 30min prior to drain disposal.

Please note that EHS recommends against using 10% bleach, as it is only stable for 24 hours after which it is no longer an effective decontaminant. Bleach may only be used if the biohazardous waste is decontaminated and disposed of on the same day the bleach solution is prepared.

When the vacuum suction is applied, the media flows directly into the top of the flask while the suction from the vacuum line pulls air from the side of the flask through the HEPA filter, which protects the vacuum line and the user from contamination.

Tip: Use parafilm around connection points to make the best seal.

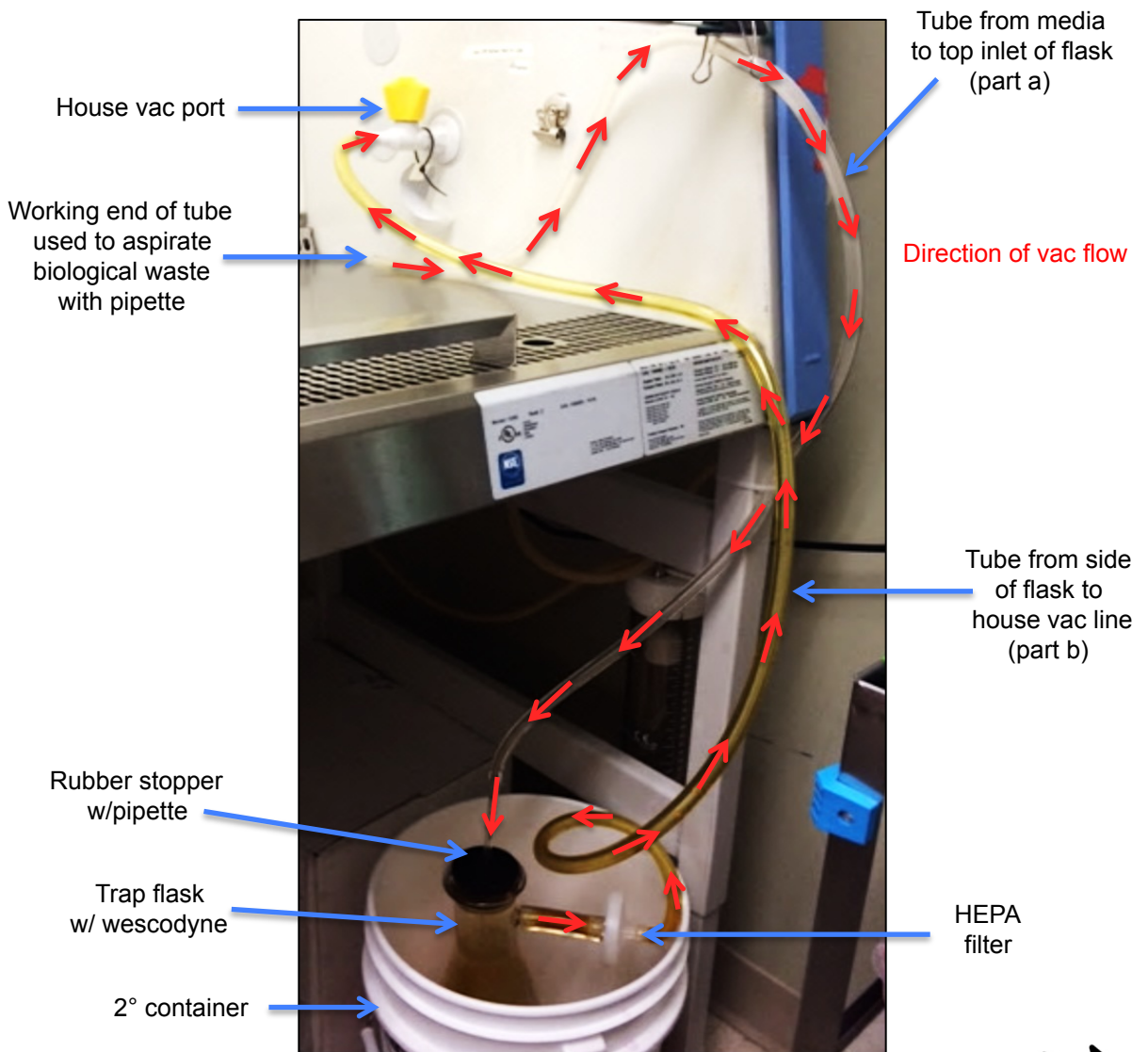
NOT ACCEPTABLE FOR DRAIN DISPOSAL: HAZARDOUS WASTE

If there are any chemical constituents, other than the disinfectant, or radiological constituents that are not acceptable for drain disposal, the tissue culture waste must be managed as hazardous waste in accordance with the Dartmouth College Waste Disposal Procedures.



3. **LABEL:** Label trap flasks with a Biohazardous Waste Label, available from EHS, and indicate the disinfectant used and date added.
4. **CONTAINMENT:** Place the vacuum flask in secondary containment (e.g., bin or tray) if outside a biosafety cabinet to hold the liquid if it is spilled or released.
5. **MAINTENANCE:** In labs where the vacuum lines are used routinely, filters should be changed every six months. Otherwise, an annual change is sufficient. However, if the filter should become clogged, change the filter immediately before further use.

FIGURE 2. Proper Assembly



Thanks for reading!

HAVE QUESTIONS?

Please call Brenda Petrella, PhD
Biological Safety Officer
(603) 646-9790

