

## BIOSAFETY CABINET USE GUIDE

Version	Date	Comments
1	July 2012	Initial <i>Biological Safety Cabinet Use Guide</i>
2	January 2015	Revision and update

### A. SUMMARY

The purpose of this Guide is to explain the procedures that should be followed while working in a biosafety cabinet. This Guide is based upon the publication *Primary Containment for Biohazards: Selection, Installation and Use of Biological Safety Cabinets*.

### B. SCOPE

This Guide applies to proper containment of infectious materials. Biosafety cabinets are the primary means of containment for working safely with infectious materials. Biosafety cabinets are designed to provide personnel and environmental protection as well as protection for work materials when appropriate practices and procedures are followed. All personnel conducting work within a biosafety cabinet should follow the procedures outlined in this Guide.

### C. GENERAL INFORMATION

Biosafety cabinets serve as a primary barrier for containment of infectious organisms. Containment is accomplished by laminar flow and high-efficiency particulate air (HEPA) filtration. A HEPA filter removes only particulates, not vapors or gasses, from the air. A HEPA filter is efficient in trapping 99.97% of particles at 0.3 microns and even more efficient in trapping particles greater or less than 0.3 microns. Bacteria, spores, and viruses are removed from the air by HEPA filters.

All maintenance and repairs of biosafety cabinets must be performed by a qualified technician who is familiar with the proper maintenance procedures required for this equipment. If the cabinet was used for infectious materials, no maintenance should be performed on the interior of the cabinet (area behind the access panels) unless the cabinet has been decontaminated.

Biosafety cabinets should be located away from the entrance to the laboratory, high traffic areas, laboratory ventilation, and equipment that may disrupt airflow.

### D. PREPARATION

- Before starting work, verify the biosafety cabinet is functioning properly by checking the Magnehelic gauge. The reading should correlate with airflow noted in the current calibration record posted on the cabinet. If higher, contact EHS.

- If the biosafety cabinet is off, turn it on and wait 5 minutes before use.
- The drain valve should be closed.
- Adjust stool height and position so that your face is above the lower edge of the sash.
- Disinfect the interior walls and work surface of the biosafety cabinet with an approved disinfectant. If bleach is used, wipe the surface with 70% ethanol to remove residual chlorine that may corrode the stainless steel surface. Use appropriate tools to wipe down the cabinet. Do not lift the sash above the recommended height or put your head or body into the cabinet.
- Wipe all material and equipment with disinfectant prior to placing items in the cabinet to prevent the introduction of contaminants to the biosafety cabinet.
- Place all material into the biosafety cabinet before beginning work to minimize movement in and out of the cabinet.
- Organize the work area with a “clean” area on one side of the cabinet, a “dirty” area on the other side, and work area in the middle.
- When setting up equipment and cultures in the cabinet, it is recommended that potentially infectious materials be the last items to be placed in the cabinet and the first items decontaminated and removed.

## **E. WORK PROCEDURES**

- Work from the clean area to the dirty area across the work surface.
- Conduct work as far back in the cabinet as is practical and at least 4 inches from the front grill.
- Place aerosol-generating equipment (vortexer, mixer, microcentrifuge, etc.) toward the back of the work surface.
- Hold open tubes or bottles at a slight angle, not in a vertical position.
- When using Petri dishes or tissue culture dishes, keep lids directly above the open sterile surface to minimize impaction of downward air onto the media.
- Never place bottles or tube caps directly on the work surface. Keep absorbent material soaked in disinfectant nearby to place caps on, if necessary.
- Recap or cover bottles or tubes as soon as possible.
- Aspirator bottles or suction flasks should be connected to an overflow collection flask filled with disinfection and to an inline HEPA filter. See section F.
- Never use an open flame or hot plate in the cabinet.
- Do not rest arms on the front grill.
- Decontaminate the work surface, the sides, and interior sash with an approved disinfectant.
- If the disinfectant used chlorides or halogens, clean stainless steel surfaces with 70% alcohol or similar noncorrosive antimicrobial agent to prevent damage to stainless steel surfaces.

## **F. VACUUM LINE TRAPS AND FILTER**

- Chemical traps and filters prevent suction of material into the vacuum lines. A hydrophobic HEPA filter trap must be installed on all vacuum lines within the biosafety cabinet to keep infectious materials out of the lines and to prevent sample contamination.
- Chemical traps must be used to decontaminate waste from cell culture or from work with live virus. For the latter, a chemical disinfectant trap within the biosafety cabinet is required.
- When using a vacuum line chemical trap, prior to the collection of the liquid waste, add concentrated disinfectant to the vacuum flask in sufficient volume so that, when collection is complete, the final solution will contain the appropriate concentration of disinfectant. Maximum collection volume should be no more than two-thirds full.
- Vacuum line filters should be examined before each use and replaced if clogged or if liquid makes contact with the filter.

## **G. CABINET FAILURE**

- When the biosafety cabinet fails (alarm sounds indicating reduced air flow), perform the following steps.
- Cease work and secure material.
- Close the sash and post a “do not use” sign on the biosafety cabinet.
- Contact the Environmental Health and Safety Office (EHS) who will coordinate repair of the cabinet.

## **H. BIOSAFETY CABINET CERTIFICATION**

Biosafety cabinets are certified at least annually, during initial installation, anytime they are moved or relocated, and after a major repair such as replacement of HEPA filters or the motor.

- Biosafety cabinets will be decontaminated prior to certification as necessary.
- Decontamination utilizes paraformaldehyde in a gaseous form, therefore no occupants of the laboratory are allowed to be present during decontamination. These are typically scheduled outside of normal working hours.
- Certification is performed by an accredited contractor in accordance with NSF/ANSI 49-2012 (Annex F). Certification of the biosafety cabinet is coordinated by EHS.