

## Biological Safety Cabinet (BSC) Procedures

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### What you need to know

Biological Safety Cabinets, (BSCs), also known as tissue culture hoods, are designed to provide personnel, environmental and product protection when appropriate practices and procedures are followed. Class II BSCs rely on directional movement of air to provide containment. Airflow is drawn into the front grille of the BSC, providing personnel protection. The most commonly used BSC is a Class II A2. This type of BSC is not suitable for volatile solvents.

BSC installation, required annual certification, decontamination and maintenance must be done by certified (accredited by the National Sanitation Foundation) professionals or by a certified Environmental, Health & Safety (EHS) technician. Maintenance and certification will be done in accordance with EHS.

Contact EH&S if you plan to purchase or relocate a biological safety cabinet or bring a unit to WCU from another university. EH&S can help you select the appropriate cabinet for your research, evaluate the space you are considering, and determine, if necessary, ventilation and utilities are available.

### Preparing BSCs for Work

- Confirm BSC annual (within 12 months) certification is current; information found on sticker on front of BSC.
- Operate the BSC blowers for at least 3-5 minutes before beginning work to allow the BSC to “purge” particulates.
- Disinfect all interior surfaces of BSC work area with an appropriate surface disinfectant (i.e. 10% bleach followed by 70% ethanol).

### Working in the BSC

- When working in the BSC, move arms in and out slowly, perpendicular to the face opening to reduce disruption of air curtain.
- Perform all operations at least 4 inches from the front grille on the work surface.
- Do not bring potentially contaminated materials out of the BSC until they have been surface decontaminated.
- Disposable underpads can be placed on the work surface but **must** not cover the front or rear grille openings.
- Place all material as far back in the BSC as practical, toward the rear edge of the work surface and away from the front grille of the BSC.
- Place aerosol-generating equipment (e.g. vortex mixers, tabletop centrifuges) toward the rear of the BSC.
- Do not place any objects such as papers, notebooks, etc. on the front grille.
- Loose or light weight-items (i.e pipette sleeve, paper towel, Kimwipes) should not be left inside the BSC at any time to reduce the potential of being drawn into the containment/motor area of the BSC.
- The workflow should be from “clean to dirty”. Materials and supplies should be placed in the BSC in such a way as to limit the movement of “dirty” items over “clean” ones.
- When finishing working in the BSC apply appropriate disinfectant. When using alcohol, the BSC sash is to remain open to allow for alcohol evaporation; sash can be lowered after sufficient time. The recommended minimum time for sash to remain open is 10 minutes.

## Open Flames in a BSC

Use of gas burners or alcohol flames in BSCs is prohibited at West Chester University. This decision has been made in accordance with recommendations from numerous agencies.

The Centers for Disease Control and Prevention (CDC) reports that "open-flames are not required in the near microbe-free environment of a biological safety cabinet" and create "turbulence which disrupts the pattern of air supplied to the work surface," jeopardizing the sterility of the work area. This is also the recommendation of the World Health Organization (WHO) as well as the major BSC manufacturers.

- Open flames in BSC are not to be used.
- If a researcher requests to use open flames, EHS personnel will meet with the researcher and discuss issues and solutions.
- If it is deemed absolutely necessary for the work being done, use a pilotless burner or safety touch-plate microburners to provide a flame on demand.

## UV Lamps in a BSC

The CDC and the National Institutes of Health (NIH) agree that Ultraviolet (UV) lamps are not recommended nor required in BSC. UV lamps **must** be turned off when the room is occupied to protect eyes and skin from UV exposure, which can burn the cornea and cause skin cancer. Proper use and cleaning of BSC negates any need for the use of UV lamps. Numerous factors affect the activity of the germicidal effect of UV light, which require regular cleaning, maintenance, and monitoring to ensure germicidal activity.

## Personal Protective Equipment

Appropriate personal protective equipment (PPE) must be worn. Lab coats must be buttoned. Gloves should be pulled over the wrists of lab coat, not worn inside coat. Additional PPE to be used as necessary. Contact EHS regarding questions about PPE.

## Ventilation Engineering Controls

A biological safety cabinet (BSC) is a Class II unit providing personnel, product and environmental protection. The majority of applications involve containment of biological hazards while providing sterile field for vulnerable experimental materials.

**Provided Services:** EHS provides and schedules annual certification with aerosol challenge filter testing, filter repair/replacement, balancing, maintenance, and decontamination as necessary. EHS can also provide air flow testing between inspections as needed. Contact EHS if you feel a BSC is not operating as it should.

## Waste Disposal

Contact EHS if you have questions or to schedule a biological waste disposal.

## Exposure/Unintended Contact

*If an employee is in need of emergency medical attention, call 911 immediately.*

- Contact EHS for advice on symptoms of chemical exposure, or assistance in performing an exposure assessment.
- Report all work related accidents, injuries, illnesses or exposures to Human Resources within 24 hours by completing and submitting the [Employee's Report of Occupational Injury or Disease](#) form.
- Notify EHS and Supervisors.

## Unsafe Engineering Control Equipment

EHS occasionally identify unsafe conditions related to the engineering control equipment they certify. In these circumstances, EHS has the authority to remove the equipment from service.

After it has been determined there is an unsafe condition, EHS must take the following actions:

1. Post out of service signage on equipment using the [Appendix A form "Out of Service"](#).
2. Notify the on-site owner/operator of the equipment that this equipment cannot be used. Notification would typically be made to the lab manager, supervisor, and/or Principal Investigator (PI).
3. When a work request is submitted to Facilities, EHS will work with lab managers or PIs to find solutions to their engineering control needs and ensure safe practices are followed until the situation is resolved.

**Commissioning Equipment:** Upon receiving notification that the equipment has been repaired, EHS will attempt to certify the unit. If certification is achieved, the equipment will be put back in service and the posting will be removed.

## Decommissioning for Repair, Transfer, or Scrap

Contact EHS to coordinate decommissioning of equipment. BSC decontamination, maintenance, and disposal must be done by a certified (accredited by the National Sanitation Foundation) professional or by a certified Environmental, Health & Safety (EHS) technician.

- All BSCs transferred to another university or institution shall be decontaminated.
- All BSCs transferring from another university or institution will be required to arrive with a Certificate of Decontamination completed.

*Reviewed: May, 2023*

## Appendix A: "Out of Service" Form

# DO NOT USE – OUT OF SERVICE

This equipment has been placed out of service by EHS due to unsafe conditions. Unsafe conditions indicate there is a reasonable probability that use of this equipment may result in physical harm, fire, or the significant environmental impact.

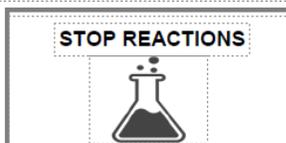
### EHS found this equipment to have:

- Unacceptable Air Flow \_\_\_\_\_
- Mechanical Hazard \_\_\_\_\_
- Electrical Hazard Flow \_\_\_\_\_
- Other \_\_\_\_\_

EHS Representative \_\_\_\_\_ Date posted \_\_\_\_\_  
Contact EHS Office (3333)

### FOR FUME HOODS ONLY

The laboratory staff must complete the following tasks before fume hood is repaired:



### Information for Maintenance Technician

Certain conditions should be met before maintenance is performed on a laboratory fume hood depending on the scope of work. Maintenance that requires entering an exhaust system or contacting the interior surfaces of the hood or exhaust system must follow the "Servicing Potentially Hazardous Exhaust Systems" guideline. Work on a roof must follow the "Roof Access for buildings with Potentially Hazardous Exhaust" guideline.

The laboratory staff must perform the tasks listed above for any exhaust shutdown, roof access, or contact with the interior of the hood or exhaust system. If the issue with the fume hood does not involve inadequate air flow, and the repair would not disrupt the operations in the hood, then tasks 1 and 2 above can be waived by the maintenance personnel. If there are concerns regarding what you are observing in the laboratory or fume hood, discontinue work and ask laboratory personnel or building manager to address the situation. Contact your EHS Representative and notify the Asset Supervisor if there is no resolution.

Serviced by \_\_\_\_\_

Date Completed \_\_\_\_\_