SOP – BSC Standard Operating Procedures for the Safe Operation of Biological Safety Cabinets
Date: May 2, 2025

Purpose:

To detail the safe operation of biological safety cabinet (BSC) use in campus laboratories and to ensure adequate containment of biological materials. Use BSCs for all activities/experiments that demand a microbe-free work environment necessary for cell culture propagation and handling of any infectious organisms. All users of BSCs shall be familiar with this procedure.

Safety Precautions:

- All operators must receive training on the safe operation of the BSC before using the equipment. Training may be delegated to a qualified individual, but it is the ultimate responsibility of the Principal Investigator (PI).
- To protect yourself and your samples from contamination, wear the required PPE, including a lab coat, gloves, eye/face protection, and a respirator (if needed).
- Ensure the work area is unobstructed. If materials are stored in the BSC, place items adjacent to the side wall.
- Always work at least 6" (15 cm) in from the front lip of the BSC.
- Never block the front air intake grille.
- While working within a BSC, set the sash at the correct height, which is generally recommended to be 8" to 10", depending on the manufacturer's guidelines.
- Keep sashes fully closed when not in use.

Ultraviolet Light use:

The Centers for Disease Control and Prevention (CDC) and the National Institutes of Health (NIH) agree that UV lamps are not recommended or required in BSCs. Do not rely on UV light for BSC sterilization or decontamination. LSUHSC policy requires BSC sterilization/ decontamination using liquid disinfectant methods. If installed:

- Users are responsible for UV lamp repairs.
- Turn lamps off when in use to protect eyes and skin from UV exposure.
- Keep the BSC sash closed when the UV light is on and not in use.

Other Considerations:

- If a BSC is malfunctioning, do not attempt to use it. Alert other users and post a sign indicating the cabinet is out of service. Contact EH&S at safety@lsuhsc.edu for assessment.
- Clean up any minor spills as they occur.
- If an experiment is left unattended inside a BSC, alert other users and post a sign indicating an experiment is in progress, along with user contact information.
- Do not store items on top of the BSC, as this could affect the unit's performance and potentially damage the HEPA filters.

Use Procedure:

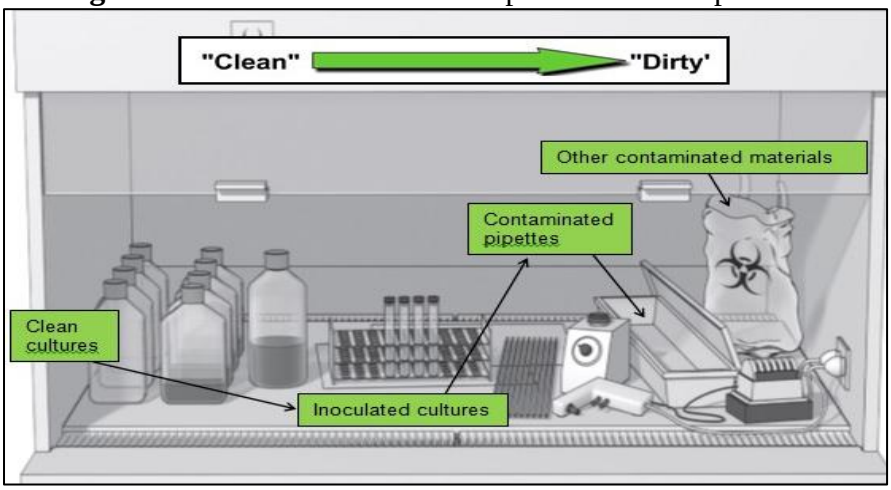
Preparation

- Only personnel trained in the safe use of a BSC and on applicable laboratory hazards may work in a cabinet. If it is your first time working with BSCs or lab-specific hazardous materials, ensure you have received supervisory training and have reviewed the applicable SDSs for chemicals and institutional / lab-specific operating procedures for working with microorganisms.
- Lift the sash to the recommended height.
- Disinfect the work area before use. Wipe the inner surfaces of the BSC, including the sidewall, back wall, inside of the sash, and work area, with a suitable disinfectant, such as a 10% bleach solution followed by 70% ethanol, an iodophor, or quaternary ammonium compound.
- Prepare the work area for working from clean to contaminated areas. Set up your cabinet to reduce the potential for contamination. All materials must be placed as far back in the cabinet as practical, toward the rear edge of the work surface and away from the front grille of the cabinet.
- Allow the cabinet to run for at least 3-5 minutes (or the manufacturer's recommended time) to purge the particulates in the cabinet.
- Use a Kimwipe or equivalent to confirm inward airflow in the middle of the BSC. If present, record the pressure differential gauge reading and compare it to the calibration set point.
- If the cabinet is equipped with an alarm, test it and switch it to the "ON" position. Do NOT work in a BSC while a warning light or alarm is signaling.
- If applicable, close the drain valve under the work surface before beginning work to contain contaminated materials within the cabinet should a large spill occur.
- To protect yourself and your samples from contamination, wear the required PPE, including a lab coat, gloves, eye/face protection, and a respirator (if needed).
- Adjust the stool height so that armpits are level with the bottom of the view screen or sash.

Operation

- Active work should flow from clean to contaminated areas across the work surface.

Figure 1 – Interior BSC materials placement example.

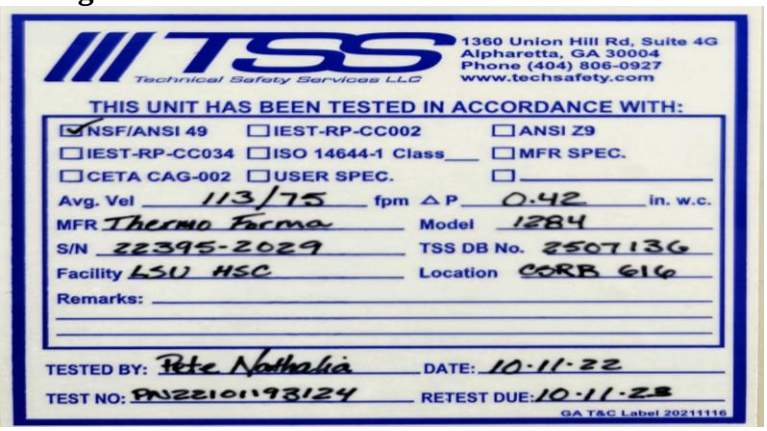


- Move arms in and out slowly, perpendicular to the front opening, to minimize disruption of the air curtain and laminar flow.
- Work at least four (4) inches from the inside edge of the front grille.
- Always use mechanical pipetting aids. Mouth pipetting is not allowed.
- Heat sources such as Bunsen burners and open flames are strictly prohibited inside the BSCs. They greatly disrupt the laminar flow of air and can damage the cabinet interior and HEPA filters.
- Micro-burners or electric "furnaces" may be used to sterilize bacteriological loops.
- Locate liquid waste traps inside the cabinet and use an in-line HEPA filter to protect the vacuum line. To prevent breakage, place traps on the floor in a secondary container (such as a durable plastic tray or box).
- Leave the cabinet blower switch in the "on" position during the post-work cleaning procedures listed below:
    1. Clean/decontaminate the surfaces of equipment and lab materials before removing them from a BSC.
    2. Close the biohazard waste bag or container and clean the surface before removing it from a BSC.
    3. Clean the inner surfaces of the BSC, including the sidewall, back wall, inside of the sash, and work area, with a suitable disinfectant, such as a 10% bleach solution followed by 70% ethanol, an iodophor, or quaternary ammonium compound.
    4. Remove your gloves and dispose of them according to your laboratory SOP.
    5. Leave the blower motor on for at least 4 minutes before turning it off.
    6. Wash your hands with soap and water as appropriate.

Annual Inspections / Certification:

BSCs are inspected and certified annually by EH&S. BSC certification is indicated by labels posted on the equipment. Do not use a BSC unless within the certification retest date. Contact EH&S if an updated certification is required.

Figure 2 – NSF certification label for BSCs.



Equipment Decontamination:

Before performing repairs, relocation, or disposal, BSCs used for research involving potentially infectious agents or human-sourced material must be decontaminated by an NSF-accredited

professional. To schedule a BSC decontamination for these purposes, create an online work request or contact the Biological Safety Officer at safety@lsuhsc.edu or 504-568-6585.
EH&S will coordinate the decontamination and necessary recertification with the lab user group and decontamination vendor.

References:

1. Fundamentals of Working Safely in a Biological Safety Cabinet
2. CDC BMBL 6th Edition
3. OSHA Factsheet Biosafety Cabinets