

## Biosafety Cabinets (BSCs)

Properly maintained Biosafety Cabinets (BSCs), when used in conjunction with good microbiological techniques, provide an effective containment system for safe manipulation of moderate- and high-risk infectious agents [Biosafety Level 2 (BSL-2) and 3 (BSL-3) agents]. BSCs protect laboratory workers and the immediate lab environment from infectious aerosols generated within the cabinet. BSCs must be certified when installed, whenever they are moved and at least annually. Principal Investigators (PI) should ensure that a risk assessment has been completed and approved for the work to be conducted and to identify the class and type of BSC needed for the operation or procedure.

### Principal Investigators (PI) should train workers to do the following before using the BSC

- Prepare a written checklist of materials necessary for a particular activity and place only necessary materials in the BSC before beginning work.
- Turn off any overhead room germicidal ultraviolet light (UV) and any BSC UV lights.
- Confirm that the BSC is currently certified for use.
- Confirm that the BSC is operating properly prior to beginning work by checking airflow gauges.
- Adjust the stool height so that armpits are level with the bottom of the view screen or sash.

### PI's should train workers to do the following when working inside the BSC

- Store extra supplies outside the BSC. Only materials and equipment needed for the immediate work should be placed in the BSC.
- Do not use equipment or store supplies inside the BSC that may disrupt the protective BSC airflow pattern.
- If large equipment must be placed inside the BSC, place it as far back in the BSC as practical.
- Do not work with open containers of infectious or hazardous materials in front of the large equipment.
- Move arms in and out of the cabinet slowly, perpendicular to the face opening, to limit disruption of the air curtain.
- Wear appropriate personal protective equipment. Lab coats must be buttoned and back closing laboratory gowns tied, if utilized, for greater protection. Gloves should be pulled over the wrists of lab coats, not worn inside the sleeve.

- Manipulation of materials inside the cabinet should be delayed for 1 minute after placing hands/arms inside the cabinet to allow the air to stabilize and to “air sweep” arms.
- Do not rest arms on front grille (unless the BSC is specifically equipped with features that permit this action) because doing so allows room air to flow directly into the work area rather than being drawn through the front grille. Instead, work with both arms raised slightly.
- Do not block the front grille with papers or other materials.
- Perform all operations on the work surface and at least 4 inches from the front grille.
- Allow cabinet blowers to operate for at least 3 to 5 minutes before beginning work to allow the BSC to “purge” particulates.
- If necessary, use plastic-backed absorbent toweling on the work surface (but not on the front grille) to aid in cleanup and spill containment.
- Make sure that active work flows from the clean to contaminated area across the work surface.
- To minimize frequent in/out arm movement and maintain the air barrier, do not tape autoclavable biohazard collection bags to the outside of the BSC; upright pipette collection containers should not be used in the BSC and/or placed on the floor outside the BSC. (Instead, horizontal discard trays containing an appropriate chemical disinfectant should be used).
- Use the aseptic techniques below to reduce splatter and aerosol generation:
  - Opened bottles or tubes should not be held in a vertical position.
  - Hold the lid above open sterile surfaces to minimize direct impact of downward air.
  - Open flames should not be used because they create turbulence that disrupts the pattern of air

supplied to the work surface.

- If absolutely necessary to do so, touch plate microburners that provide a flame on demand or electric furnaces are available and should be placed in the back third of the BSC. All flames must be turned off before disinfectants are used.
- Aspirator bottles or suction flasks should be connected to an overflow collection plastic flask containing an appropriate disinfectant, and to an in-line HEPA filter and located in the back corner of the BSC.
- If spilled liquid enters through the front or rear grilles, close the drain valves and pour decontaminating solution into the drain pans. Use the appropriate decontamination solution and contact time for the pathogens used in the BSC.
- Carefully handle the paper towels used for cleanup, as any materials present in the catch basin that are caught in the exhaust plenum may require BSC decontamination and the cabinet body being opened to remove the object.

- Immediately following the manipulation of infectious agents in the BSC, decontaminate

surfaces and the BSC contents with the appropriate solution and contact time necessary for the infectious agents being used. Do not allow any potential contamination on the interior surfaces to remain until the end of the work shift as this will reduce the efficiency of decontamination procedures.

- When work is finished, surface decontaminate all items that are to be brought out of the BSC prior to their removal.
- After removal of these items, the interior walls and the interior surface of the window should be wiped with 70 percent ethanol or other appropriate disinfectant.
- At the end of the workday, surface decontaminate the BSC with 70 percent ethanol or a 10% dilute bleach solution.

