Proper Use

Incorporating the elements outlined below into the applicable **standard operating procedures (SOPs)** to be followed by facility personnel is strongly recommended to encourage the proper and consistent use of a BSC by personnel to prevent **exposures** and the release of pathogens and toxins.

Start-Up Considerations

- Check that the sash is at the appropriate height. Adjust stool height so that the user's underarms are level with the bottom of the sash.
- Check the pressure gauges to verify that readings are within the acceptable range.
- If present, test the airflow alarm and ensure it is switched to the "on" position.
- Confirm inward airflow by holding a tissue at the middle of the edge of the sash to establish that it is drawn in.
- Disinfect the interior surfaces with a disinfectant effective against the infectious material and toxins used in the laboratory, allowing an appropriate contact time. If a corrosive disinfectant is used, the surface should be rinsed with water after **disinfection**.
- Assemble all materials required for manipulation and load into the BSC. Care should be taken not to overcrowd or block the front or rear grilles to prevent the appropriate airflow patterns from being compromised.
- When there is significant potential for splatter or splashes to occur during manipulations of infectious material or toxins, the work area should be lined with a plastic-backed absorbent pad.
- Place aerosol generating equipment (e.g., vortex mixer, sonicator) towards the back of the BSC, without blocking the rear grille.
- After loading material in the BSC, allow sufficient time for the air to purge and the airflow to stabilize before initiating work. This will be specified in the manufacturer's instructions, and is generally 3-5 minutes.

Working in the BSC

- Perform operations as far to the rear of the work area as reasonable. Ensure that elbows and arms do not rest on the grille or work surface.
- Avoid excessive **movement** of hands and arms through the front opening. Such movements disrupt the air curtain at the front of the BSC, which can allow contaminants to enter or escape the BSC. Arms should enter and exit the BSC slowly and perpendicular to the front opening.
- Keep a bottle of an appropriate disinfectant in the BSC while work is performed to avoid having to move hands outside of the BSC.
- Segregate non-contaminated ("clean") items from contaminated ("dirty") items. Work should always flow from "clean" to "dirty" areas (Picture at end of document).
- Material should be discarded in a **waste** container located towards the rear of the cabinet workspace. Do not discard materials in containers outside of the cabinet.
- Decontaminate the surface of all objects in the BSC in the event of a spill. The work area, including the inside surface of the window, should be decontaminated while the BSC remains in operation.
- Natural gas and propane should not be used in a BSC; sustained open flames (e.g., Bunsen burner) in BSCs are prohibited. On-demand open flames (e.g., touch-plate microburners) are to be avoided as they create turbulence in the BSC, disrupt airflow patterns, and can damage the HEPA filter (CBS Matrix

4.6). Non-flame alternatives (e.g., microincinerator, or sterile disposable inoculation loops) should be used whenever possible.
- Work in a BSC should only be conducted by one person at a time.
- Equipment creating air movement (e.g., vacuum pumps, centrifuges) may affect the integrity of the airflow and should not be used within the BSC.
- Windows that open should be kept closed when the BSC is in use.

Note: The cabinet may contain multiple "stations" that are designated for particular processes. But only one person may use the cabinet at any time

Completion of Work in the BSC

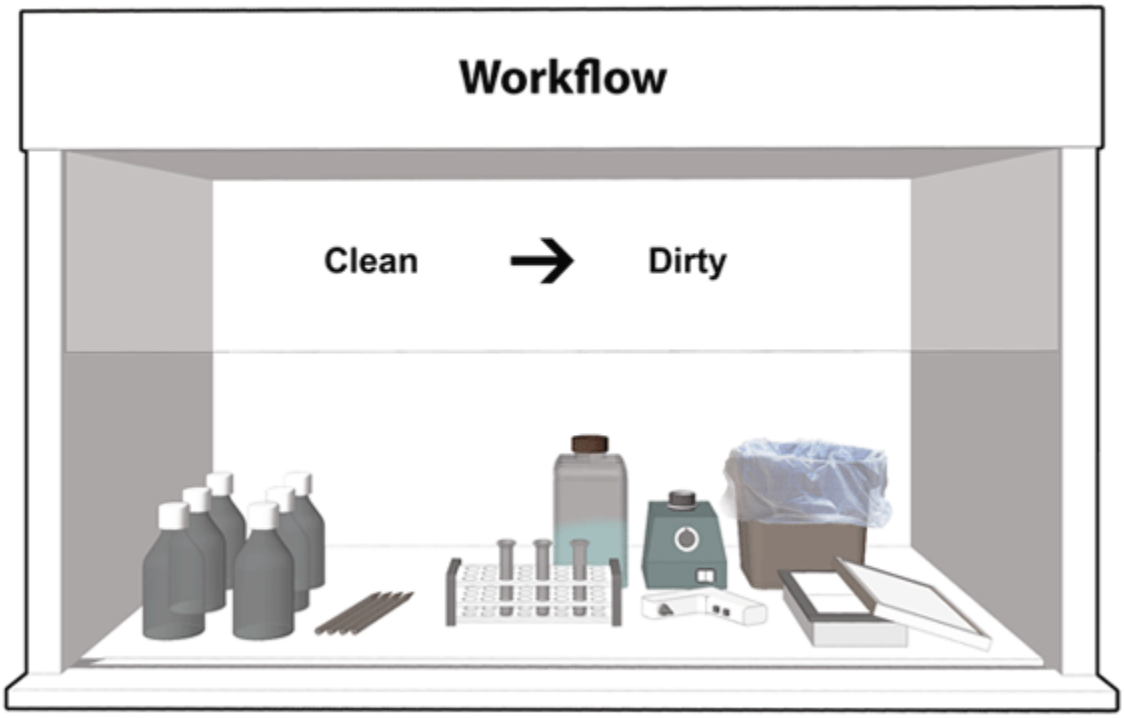
- If vacuum line was used, spray 1% sodium hypochlorite into vacuum line and make sure vacuum line is empty before turning off the pump
- Disinfect surfaces with 70% ethanol
- Allow sufficient time for the air in the BSC to purge (i.e., pass through the filter) before disrupting the air curtain by removing hands or unloading material from the BSC. The purge time will vary by model and can be up to several minutes.
- Close or cover all containers.
- Surface decontaminate items before removing them from the BSC.
- Disinfect the interior surfaces of the BSC, including sides, back, lights, and interior of the glass, with a disinfectant effective against the pathogens in use, allowing an appropriate contact time (CBS Matrix 4.6). If a corrosive disinfectant is used, the surface should be rinsed with water after disinfection to avoid corrosion of the stainless steel surfaces.
- Routinely remove the work surface and disinfect the tray beneath it.
- Routinely wipe the surface of the lights within the BSC with a suitable cleaner or disinfectant (e.g., ethanol).

Ultraviolet Light Considerations

The use of ultraviolet (UV) germicidal lamps is strongly discouraged due to their limited effectiveness at disinfecting the inside of BSCs.[Footnote3Footnote4] Personnel wishing to use UV irradiation in BSCs should receive training on the safe work practices required and the hazards of UV radiation beforehand, including the following elements:

- UV irradiation of the work area should only be used as a secondary method of disinfection in the cabinet. Never rely on UV irradiation alone to disinfect a contaminated work area.
- UV irradiation is ineffective if a **microorganism** is protected by dust, dirt, or organic matter.[Footnote4] A liquid chemical disinfectant should be the primary method of cleaning and disinfecting the interior of a BSC.
- UV irradiation does not penetrate into cracks or through the grilles of a BSC.
- UV irradiation can cause deterioration of various materials, including certain plastics and tubing.
- Never touch a UV bulb with bare hands as the natural oils from hands may leave a fingerprint and create dead space on the bulb's surface.
- UV bulbs should be cleaned frequently with an appropriate disinfectant.

- The UV lamp should be routinely tested with a UV meter to verify that the proper intensity (i.e., 40 $\mu W/cm^2$) is being delivered at the appropriate wavelength (i.e., 254 nm) in the centre of the work area. Footnote



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