



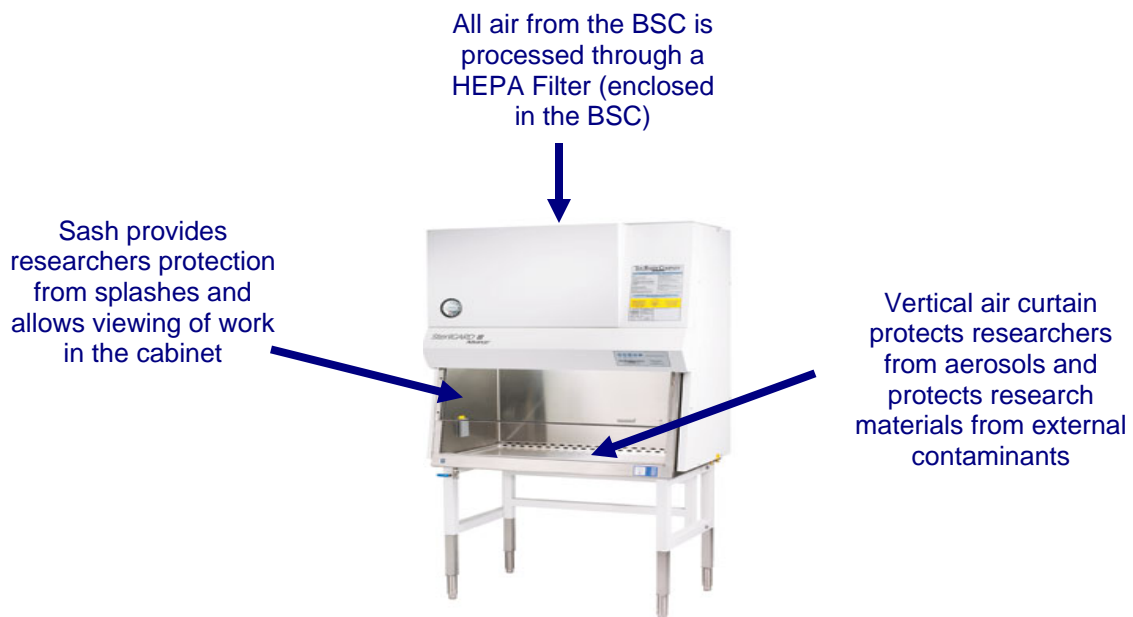
University of Pittsburgh

Department of Environmental Health and Safety

Biological Safety Cabinets – The Basics

1. Biological Safety Cabinet Operation

- Biological safety cabinets (BSCs) are a central piece of equipment in a research laboratory and are used for primary containment while working with infectious agents.
- Biological safety cabinets provide protection in 3 ways.
 1. PERSONAL protection from infectious agents used inside the cabinet
 2. SAMPLE protection from contamination
 3. LABORATORY ENVIRONMENT protection from contaminants within the cabinet



- Air curtain along with sash provide protection to personnel working in a laboratory.
- All air processed in a BSC is High Efficiency Particulate Air (HEPA) filtered meaning 99.97% of contaminants at 0.3 microns in size or larger are captured.
- Class II, Type A2 or Type A/B3 are the most common BSCs in laboratories. These cabinets provide 70% recirculated air and 30% exhausted air. Biological agents and minute quantities of chemical agents can be used in these BSCs.
- Class II, Type B2 BSCs provide 100% exhausted air. Biological agents and volatile or unknown chemicals can be used in these BSCs.

2. Biological Safety Cabinet Decontamination

- Biological Safety Cabinets are required to be decontaminated following the use of any potential infectious agents.
- Disinfectant selection should have 2 informational items listed on the label.
 1. EPA Registration Number
 2. Listing of infectious agents that the disinfectant is effective against
- The following are examples of approved EPA-Registered Disinfectants:



- Disinfectants should be listed on the following EPA Registered Antimicrobial Products lists when following BSL-2 or BSL-2+ work practices:



US Environmental Protection Agency Office of Pesticide Programs

List D: EPA's Registered Antimicrobial Products Effective Against Human HIV-1 and Hepatitis B Virus
http://www.epa.gov/oppad001/list_d_hepatitisbhiv.pdf

List E: EPA's Registered Antimicrobial Products Effective Against Mycobacterium tuberculosis, Human HIV-1 and Hepatitis B Virus
http://www.epa.gov/oppad001/list_e_mycobact_hiv_hepatitis.pdf

List F: EPA's Registered Antimicrobial Products Effective Against Hepatitis C Virus
http://www.epa.gov/oppad001/list_f_hepatitisC.pdf

- Biological Safety Cabinets are not permitted to be decontaminated with ONLY ethanol if BSL-2 or BSL-2+ agents are in use (ethanol evaporates and does not remain on the surface of the BSC long enough to provide the necessary contact time to inactivate agents). Ethanol should be used as a rinsing agent after disinfection with bleach or another EPA-Registered disinfectant.
- Ultraviolet light must not be used as the only method of disinfection of any BSC.
- Biological Safety Cabinets are required to be certified by an approved third party vendor on an annual basis.
- Third party vendor is required to decontaminate biological safety cabinets prior to repairs or relocation of the BSC in a new laboratory or an existing laboratory space.
- Biological Safety Cabinets are required to be certified by an approved third party vendor after repairs to the BSC or after the BSC has been moved.

3. Biological Safety Cabinet Proper Work Practices

A Start to Finish Reference Guide

Preparation	Working in the Cabinet	Clean Up
Keep supplies such as additional gloves, culture plates, flasks, and culture media outside BSC	Implement aseptic techniques at all times	Seal contaminated containers
Limit foot traffic near the BSC	Enter and exit smoothly and deliberately; arms at right angles to cabinet	Decontaminate all outside surfaces of materials before they are brought out of the cabinet
Keep doors and windows closed	Work in the center of the cabinet	Remove all items from the cabinet
Adjust seat height	Do not use open flames in a BSC	Disinfect the BSC work surfaces with an EPA-registered disinfectant
Operate blowers at least 4 minutes prior to beginning work to eliminate suspended particulate matter	Clean up spills in BSC immediately using appropriate disinfectant	Properly dispose of all solid biological wastes according to University Guidelines
Utilize proper PPE (i.e. lab coat, gloves, other PPE if required)	Keep materials in the BSC to a minimum	Properly dispose of all liquid biological wastes after appropriate contact time with disinfectant
Wipe or spray 10% bleach (or an approved disinfectant) to the work surface and interior walls of the BSC; avoid the supply filter diffuser	Do not block air grate in the front or back of the BSC	If cabinet is left running, leave view screen sash at half height
If applying bleach, follow with a 70% ethanol rinse and then a sterile water rinse to remove residual chlorine	Foot traffic should be kept to a minimum behind anyone working at a BSC	If cabinet is turned off, close the view screen
Plastic-backed absorbent toweling can be placed on the work surface; avoid covering the front or rear grille openings	Confirm proper operation of the biological safety cabinet by the reading on the pressure gauge before and during working in the BSC	If UV lights are used, make sure no one is in the room, close the view screen, turn on the lights and leave
Place all materials as far back in the cabinet as possible especially aerosol generating equipment	BSC height of work surface should be 28 to 34 inches from the floor with a minimum knee clearance of 27 inches	