

BSL-04 Working in a biological Safety Cabinet (BSC)

1. Scope:

When used correctly, a Biological Safety Cabinet (BSC) shield workers from the inhalation of infectious particles/microorganisms and prevent their spread into the laboratory.

It is strongly recommended that you watch the Government of Canada instructional DVD on "Containment Level 2 Laboratory Operation Practices" available on line for free at www.publichealth.gc.ca/training or you can borrow a copy from your Biosafety Officer

HOW BSCs WORK:

BSCs are designed to protect laboratory personnel and the environment from exposure to biohazards through the combined use of laminar flow and High Efficiency Particulate Air (HEPA) filters. HEPA filters trap the Most Penetrating Particle Sizes (MPPS) of 0.3 µm with an efficiency of at least 99.97%. Larger and smaller particles are captured with greater efficiency. Thus, bacteria, spores, and viruses are removed from the air by HEPA filters.

2. Responsibilities:

This SOP should be followed by any user of a BSC (e.g. undergraduate student, graduate student, principal investigator)

3. Materials:

- a. Biological safety cabinet
- b. Soap
- c. Gloves
- d. lab coat/disposable gown
- e. disinfectant (70% Ethanol, 10% bleach)

4. Safety:

If you do not follow these instructions, the protection of your health and the environment is not guaranteed.

I. GENERAL PRACTICES

- Only one person at a time should work in a BSC (Certification standards are based on one person using the cabinet at a time. If more than one person uses the cabinet at one time, user protection is no longer guaranteed.)
- Cabinets must be certified annually. Moving or any repairs to the cabinet means it will need to be recertified.
- Arm movements disrupt air currents within the cabinet. Avoid excessive movement of materials and movement of hands and arms through the front access opening during use.
- Enter or exit the cabinet from straight on, and allow the cabinet to stabilize before working.
- Perform operations as far to the rear of the cabinet work area as possible.
- Don't over load the Cabinet.
- Clean benches and fume hoods are not Biological Safety Cabinets.
- Do not use open flames in the BSC. Flames create turbulence, disrupt airflow patterns and can damage the HEPA filter. Disposable sterile loops or micro-incinerators should be used.

- Keep discarded, contaminated material to the rear of the cabinet and do not discard materials in containers outside of the cabinet.
- If there is a spill during use, surface decontaminate all objects in the cabinet; disinfect the working area of the cabinet while it is still in operation (do not turn the cabinet off)
- Always use proper aseptic techniques.
- Do not rely on UV lights to ensure proper disinfection of the cabinet before or after use.



REMEMBER:

The main purpose of a BSC is to **protect you and the environment** from exposure to biohazards while working with infectious agents

In addition, Class II and III BSCs will protect your research materials from airborne contaminants with the aid of HEPA supply filters

5. Procedure:

I. PRIOR TO USE

1. Wash your hands with soap and water and put on the appropriate PPE (at a minimum gloves and a buttoned down or disposable gown).
2. Raise the sash to the proper height.
3. Turn on the blower and light (turn on blower 5 min. prior to work)
4. Confirm that air is flowing inward by holding a tissue at the middle of the edge of the viewing panel. If it is working the tissue is drawn into the BSC.
5. Wipe down the surface, walls, grills, and view screen of the BSC with an appropriate disinfectant.
6. Placing an absorbent pad under the work area will help absorb any drops and help the creation of aerosols.
7. Only load the cabinet with necessary materials and reagents - Make sure that you disinfect the outer surface of medium bottles and pipettes before putting them in the BSC.
8. If working with sharps, place a sharps container in the BSC for safe disposal

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9. Place a plastic biohazard bag in the BSC, all contaminated waste will be placed in biohazard bag
- II. WHILE WORKING IN THE BSC
1. Ensure the air intake and exhaust grills are not obstructed.
 2. Do not disrupt the protective airflow pattern - Avoid rapidly moving your arms in and out of the cabinet, people walking rapidly behind you, and open laboratory doors, which may reduce the effectiveness of the BSC.
 3. Establish working areas and always work from the clean to the dirty area (see Fig 1.).

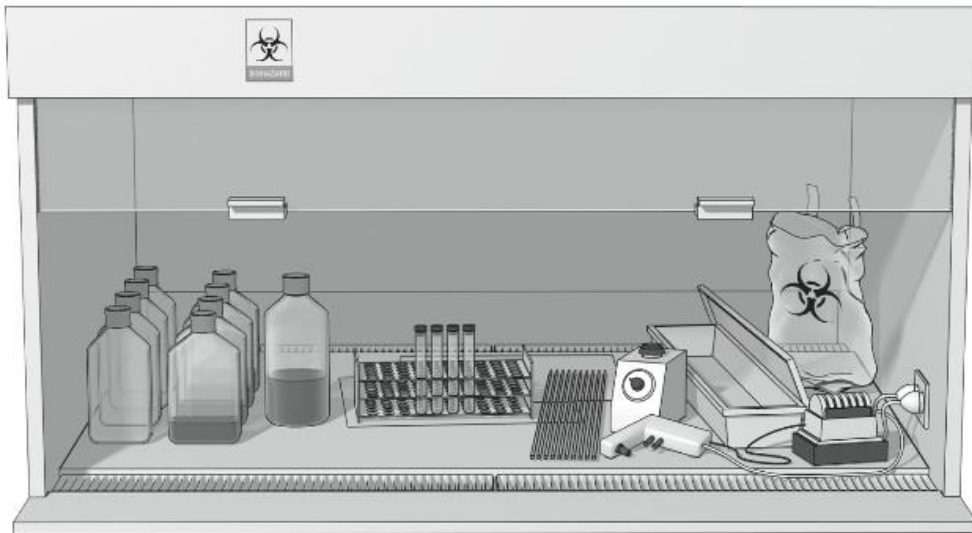


Fig 1. A typical layout for working “clean to dirty” within a Class II BSC. Clean cultures (left) can be inoculated (center); contaminated pipettes can be discarded in the shallow pan and other contaminated materials can be placed in the biohazard bag (right). Source: Biosafety in Microbiological and Biomedical Laboratories, 5th Edition.

4. Clean spills as soon as they occur and replace broken/dirty gloves.
- III. AFTER USE
1. Purge the air inside the BSC by allowing it to run for a minimum of 5 minutes after all work has been completed.
 2. Disinfect the materials/supplies (e.g., media bottles, pipettes) that have been inside the cabinet before taking them out.
 3. Remove and discard waste bag after thoroughly disinfecting it with the appropriate disinfectant.
 4. Wipe down the BSC.
 5. Turn off the blower and light and close the sash.
 6. Do not expose yourself unnecessarily to the UV light, since this can result in skin burns and eye lesions and, in the long term, development of melanoma.
 7. Remove PPE and wash hands.
 8. If biohazard bag used, autoclave the waste.

6. Records:

- A sign up calendar for daily use will be posted by the BSC, if required states

- A log book is kept by the BSC and the user must record the user name, date, times, name of Principal investigator, Risk group and indicate if a permit is available

7. List of attachments:

none

8. History:

Created by Lydia Troc October 15, 2015.

9. Approval: