

## BIOLOGICAL SAFETY CABINETS VS. LAMINAR FLOW HOODS

### PURPOSE

This cheat sheet aims to help our junior researchers understand the differences between biological safety cabinets (BSCs) and laminar flow hoods (LFHs) and prevent themselves from misusing these two types of hoods.

### BIOLOGICAL SAFETY CABINETS

The BSCs are primary containment devices that protect you and your immediate work environment from exposure to biohazardous material. Among the three classes of the BSC, Class I BSC only provide personnel and environmental protection, while Class II and III also provide product protection. At the University of Ottawa, Class II BSCs are the most commonly used BSCs in the microbiological laboratories.

While working in a Class II BSC (Figure 1), personnel protection is provided through a continuous inflow, which helps prevent aerosols from escaping through the front opening. The air that is exhausted into the surrounding containment zone or directly to the outside atmosphere is passed through high efficiency particulate air (HEPA) filters to protect the environment. The product protection is offered by using HEPA-filtered downflow to flush the cabinet interior of airborne contaminants and to prevent unfiltered inflow air from entering the work area. A BSC provides effective containment for work with infectious material or toxins when it is properly maintained and utilized.

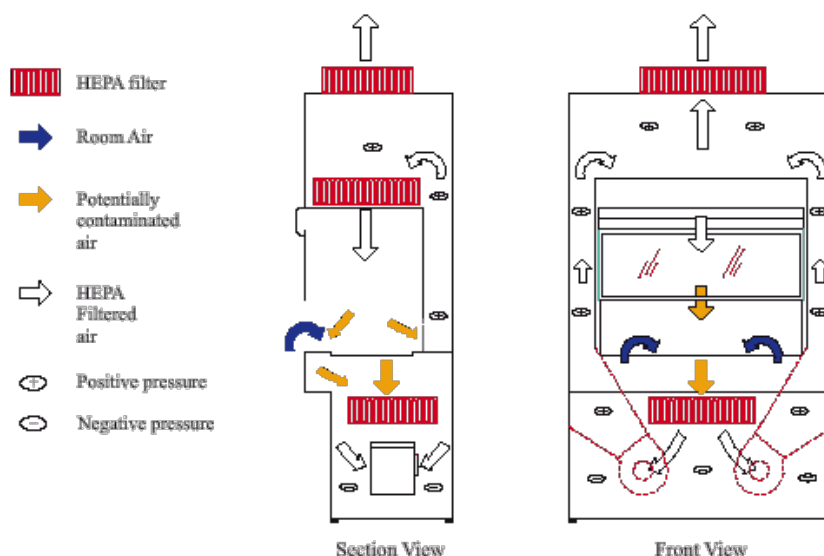


Figure 1. A Class II BSC.

### LAMINAR FLOW HOODS

The LFHs, known as the “clean benches”, are designed to provide product protection only, and should not be used when manipulating infectious material. The supply air is HEPA-filtered and flows vertically or horizontally, passing through the hood to maintain a clean work area (Figure 2).

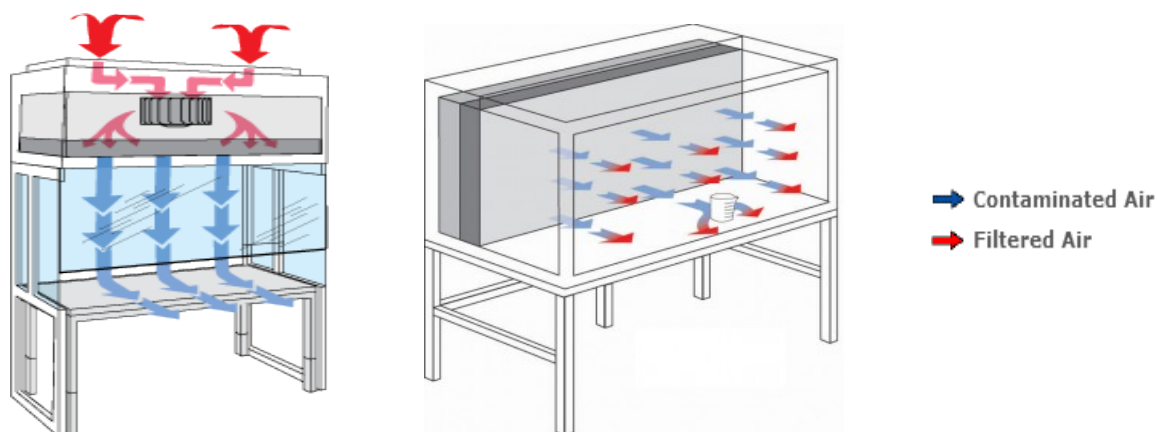


Figure 2. LFH provide vertical clean airflow (left) and horizontal clean airflow (right).

### BSC VS. LFH

A comparison between BSCs and LFHs is summarized in the table below. Make sure you know the research requirements and choose to work in the right hood.

Table 1. The similarities and differences between BSC and LFH

About the hoods:	BSC	LFH
• Help achieve biosafety	Yes	<b>No</b>
• Equipped with HEPA filter(s)	Yes	Yes
• Supply air is filtered	Class I – <b>No</b> Class II/III – Yes	Yes
• Exhaust air is filtered	Yes	<b>No</b>
• Provide product protection	Class I – <b>No</b> Class II/III – Yes	Yes
• Provide personnel protection <sup>1</sup>	Yes	<b>No</b>
• Provide environmental protection <sup>2</sup>	Yes	<b>No</b>
• Can be used for non-infectious work	Yes	Yes
• Can be used for infectious work	Yes	<b>No</b>
• Can be used for chemical hazards work <sup>3</sup>	Small amounts might be used in Class II B2	<b>No</b>
• Surface must be disinfected after use	Yes	Yes
• HEPA filters must be certified annually <sup>4</sup>	Yes	Recommend every 2 years

<sup>1, 2</sup> For more information about the safe use of a BSC, please refer to working with BSC SOP found within the Biosafety Manual.

<sup>3</sup> It is always the recommendation to use a fume hood when manipulating chemical hazards. While small amounts of hazardous chemical might be used in certain BSCs, never use flammable, toxic or explosive substances in a BSC.

<sup>4</sup> Please check the *HEPA Certification* cheat sheet for details.

## REFERENCES

1. Public Health Agency of Canada. *Canadian Biosafety Handbook, 2<sup>nd</sup> Edition*.
2. Terra Universal Inc. (Aug. 4, 2014) *Horizontal vs Vertical Laminar Flow Hoods*.  
[Horizontal vs Vertical Laminar Flow Hoods](#)

**Note:** Office of the Chief Risk Officer (OCRO) is available for consultation if you have any questions regarding the use of BSC and LFH. Email: [bio.safety@uottawa.ca](mailto:bio.safety@uottawa.ca).