



Laboratory Hoods—What's the Difference?

Many biomedical research laboratories use ventilation equipment to protect the worker and/or the experiment. Examples include: biosafety cabinets (BSC), fume hoods, laminar flow clean benches, and animal transfer stations. These containment devices differ in the type and level of protection provided to the worker, the environment, and the experiment. Work involving hazardous agents should always be conducted in an appropriate containment device in order to protect the worker. Therefore, the safety features of each device are critical to understand as you apply this to your research.

Biosafety Cabinet

A biosafety cabinet (BSC) is an essential primary containment device when working with potentially infectious materials. All BSCs use high efficiency particulate air (HEPA) filters to treat intake and exhaust air. These filtered cabinets are designed to protect the experiment and the worker. Most BSCs are designed to recirculate 70% of the air back into the lab through an exhaust HEPA filter. This purifies the air of potentially infectious aerosols as well as animal dander or bedding but does not reduce exposure to chemicals or gases including waste anesthetic gases such as isoflurane. To address waste anesthetic gasses or chemicals used with a biohazardous agent, a special type of ducted BSC should be used. The UNMC Biosafety Officers can provide guidance on the purchase of the appropriate BSC for your laboratory.

Laminar Flow Clean Bench (Clean Bench)





A laminar flow clean bench is NOT a BSC. These devices do not provide any protection to the worker. Clean benches are designed to provide a clean environment to protect the product. HEPA-filtered air is discharged across the work surface and out toward the user, effectively blowing any pathogens or contaminants into the user's face and breathing zone. Clean benches should only be used for work with non-infectious/non-toxic materials such as media preparation or transfer of sterile fluids between containers. Work with potentially infectious materials, toxins, volatile chemicals, or materials that may cause hypersensitivity to the worker such as animal dander should not be performed in a laminar flow clean bench.

Animal Transfer Station

Animal transfer and cage changing stations are portable downdraft-filtered laminar flow benches (clean benches) that have been specifically modified for small rodent handling and cage changing. These stations provide improved laboratory animal allergen control from dust and dander while performing animal husbandry activities. These units are NOT BSCs and should not be used for work with potentially infectious materials, toxins, or volatile chemicals.

Chemical Fume Hood

A chemical fume hood is a ventilated, enclosed workspace intended to capture and exhaust dangerous chemical vapors and particulate matter. No HEPA filtration of either the intake or exhaust air occurs and contaminated air is exhausted outside the laboratory. Fume hoods are most suitable for chemical use and other work where sterility of the experiment is not a concern. Fume hoods should be utilized for hazardous drug or chemical preparation or when working with waste anesthetic gases such as isoflurane. Fume hoods should not be used for infectious biological work. All fume hoods on campus are hard-ducted; ductless fume hoods are not permitted.

Biosafety Cabinet (BSC)	Laminar Flow Clean Bench (Clean Bench)	Chemical Fume Hood	Animal Transfer Station
			
<p>Designed to protect against exposure to particulates and aerosols from biological agents. Provides product, personnel, and environmental protection.</p>	<p>Designed to provide a sterile work environment. Does not provide any protection to personnel or environment.</p>	<p>Ventilated, enclosed work space intended to capture and exhaust dangerous chemical vapors and particulate matter outside the laboratory.</p>	<p>Designed for animal allergen control while performing husbandry operations including cage changing or animal transfer.</p>
<p>Should only be used for work with infectious agents or for the capture of nuisance dust and allergens from bulk operations such as animal cage changing or dumping.</p>	<p>Should only be used for work with non-infectious materials such as media preparation or transfer of sterile fluids between containers.</p>	<p>Primarily for chemical use including preparation of hazardous drugs and volatile anesthetic gases used for animal anesthesia and/or euthanasia.</p>	<p>Should only be used for husbandry operations with healthy animals that have not been infected with biological agents or administered hazardous drugs.</p>
<p>In general, never use with:</p> <ul style="list-style-type: none"> • volatile or flammable chemicals • Waste anesthetic gases including isoflurane • Only certain types of ducted BSCs may be used for the above 	<p>Never use with:</p> <ul style="list-style-type: none"> • potentially infectious materials • volatile or flammable chemicals • waste anesthetic gases including isoflurane 	<p>Do not use where sterility of the product is a concern.</p>	<p>Never use with:</p> <ul style="list-style-type: none"> • potentially infectious materials • volatile or flammable chemicals • waste anesthetic gases including isoflurane

Questions? Please contact **UNMC Biosafety** at biosafety@unmc.edu or unmcehs@unmc.edu

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