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Next Review 06/2028

Owner Kristie Adams: Lab & Research Safety Officer
Area Public Safety
References CDC, NIH, NSF/ANSI + 2 more

Biological Safety Cabinet

POLICY STATEMENT

All work involving biological agents, recombinant or synthetic nucleic acid molecules, human-derived materials, or other biohazardous materials that pose a splash, spill, or aerosol exposure risk must be conducted inside a certified biological safety cabinet (BSC) or other approved primary containment device appropriate to the assigned biosafety level.

Every BSC used at the University of North Dakota (UND) must be certified upon installation, after relocation or repair, and at least annually thereafter by a qualified, NSF/ANSI 49–accredited certifier. Uncertified, expired, or malfunctioning BSCs must be taken out of service, clearly labeled as non-functional, and may not be used for work with biohazardous materials until recertified.

Principal investigators (PIs), laboratory supervisors, and instructors are responsible for ensuring that personnel who use a BSC are trained in its proper operation, that the cabinet is used only for its intended purpose, and that it is maintained, decontaminated, and serviced according to this policy. Modification, relocation, or disposal of a BSC without prior authorization from the Office of Safety is prohibited.

This policy applies regardless of funding source and supplements, but does not replace, requirements established by the UND Institutional Biosafety Committee (IBC), the NIH Guidelines for Research Involving Recombinant or Synthetic Nucleic Acid Molecules, and/or applicable federal, state, and local regulations.

REASON FOR POLICY

Biological safety cabinets are the primary engineering control used to protect laboratory personnel,

research materials, and the environment from exposure to biohazardous agents and aerosols generated during laboratory procedures. Improperly maintained, uncertified, or misused cabinets create a foreseeable risk of laboratory-acquired infection, cross-contamination, and non-compliance with federal biosafety standards.

This policy establishes consistent, university-wide requirements for the selection, installation, certification, use, and decontamination of BSCs. It is intended to satisfy obligations under the NIH Guidelines for Research Involving Recombinant or Synthetic Nucleic Acid Molecules, the CDC/NIH Biosafety in Microbiological and Biomedical Laboratories (BMBL, current edition), OSHA's Bloodborne Pathogens Standard (29 CFR 1910.1030) and General Duty Clause, and North Dakota state workplace safety requirements, and to protect the health and safety of the UND community.

SCOPE OF POLICY

This policy applies to all UND personnel and units that own, operate, service, or work in or around a biological safety cabinet, including:

- Administrators
- Faculty
- Staff
- Students
- Others: Principal investigators, laboratory supervisors, visiting scientists, contractors, and any non-UND personnel granted access to UND laboratories where BSCs are used

CONTACTS

Specific questions should be directed to the following:

Subject	Contact	Phone	Website / Email
BSC Certification, Decontamination, and General BSC Questions	Office of Safety	701.777.3341	Office of Safety Website UND.safety@UND.edu
Institutional Biosafety Committee (IBC) Protocol Review and Approval	IBC Coordinator	701.777.2492	IBC Website
Laboratory Safety Inspections and General Lab Hazards	Office of Safety	701.777.3341	Office of Safety Website UND.safety@UND.edu
Biohazardous Waste Pickup and Disposal	Office of Safety	701.777.3341	Office of Safety Website UND.safety@UND.edu

DEFINITIONS

Aerosol	Particles suspended in the air stemming from pipetting, centrifugation, sonicators, sub-culturing, lyophilization, injecting animals, etc., during laboratory procedures, which range in diameter from less than 1 μ m to
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	greater than 100 µm.
Biohazardous Agent/ Material	A biological substance that poses a threat to the health of humans, animals, or plants. This includes infectious microorganisms like bacteria, viruses, fungi, and parasites, as well as blood, bodily fluids, human or animal tissues, and laboratory waste that can cause disease.
Biological Safety Cabinet (BSC)	A ventilated, enclosed primary containment device that uses HEPA filtration to provide personnel, product, and/or environmental protection from aerosols generated during the manipulation of biohazardous materials. BSCs are classified as Class I, Class II (Types A1, A2, B1, B2), or Class III.
Biosafety Level (BSL)	A combination of laboratory practices, safety equipment, and facility design features assigned to research or teaching activities based on a risk assessment of the biological agents involved, as described in the CDC/NIH Biosafety in Microbiological and Biomedical Laboratories (BMBL).
Certification	An annual (or event-triggered) inspection and performance test of a BSC, conducted by the Office of Safety or external vendor approved by the Office of Safety, verifying that airflow, containment, and HEPA filtration meet applicable manufacturer and national standards (e.g., NSF/ANSI 49).
Class II Biosafety Cabinet	The most common BSC type; provides personnel, product, and environmental protection for work with agents assigned to Biosafety Levels 1–3. Not to be confused with a laminar flow "clean bench," which protects only the product/material, not the user.
Decontamination	The process of rendering a BSC free of viable biohazardous material, typically through fumigation with vaporized hydrogen peroxide or an equivalent validated method, prior to relocation, repair, filter change, or disposal.
Institutional Biosafety Committee (IBC)	The university committee responsible for reviewing and approving research and teaching activities involving biohazardous agents, recombinant or synthetic nucleic acid molecules, and related materials, and for establishing associated biosafety policies.
Principal Investigator (PI)	The individual with primary responsibility for the design, conduct, and oversight of a research or teaching activity involving biohazardous materials, including the safe operation of any associated BSC.
Risk Group	A classification of a biological agent (RG1–RG4) based on its relative pathogenicity, as defined by the NIH Guidelines and BMBL.

PRINCIPLES

The University recognizes the biological safety cabinet as a critical engineering control, not a substitute for sound microbiological technique, appropriate personal protective equipment, or administrative controls. A properly functioning BSC, used correctly and in conjunction with good laboratory practice, provides an effective means of containing low-, moderate-, and high-risk microorganisms (Risk Groups

1–3).

Selection and Installation

BSC selection must be based on a documented risk assessment of the agents and procedures involved, in consultation with the Office of Safety. Cabinets must be installed away from doors, high-traffic areas, and ventilation supply sources, and must not be used for procedures involving volatile chemicals unless the cabinet is specifically rated for such use and appropriately exhausted.

Certification and Maintenance

Certification is required after initial installation, after any relocation or repair, and at least annually thereafter. The cabinets are certified annually by UND Office of Safety. A cabinet that is not currently certified must be labeled "Not Certified — Do Not Use for Containment of Infectious Materials" and taken out of active use. BSCs belong to the laboratory or department that owns them and all costs associated with the BSCs are the responsibility of the owner.

Use and Decontamination

Personnel must complete required biosafety training before independently operating a BSC. Open flames are prohibited inside Class A1 and A2 cabinets; if flame sterilization is unavoidable, only touch-plate micro-burners are permitted, subject to the Office of Safety approval. Cabinets must be decontaminated by lab personnel after each use and must undergo full internal decontamination by an external vendor approved by the Office of Safety prior to relocation, filter replacement, major repair, or disposal.

Institutional Oversight

The IBC has authority to establish, monitor, and enforce biosafety requirements associated with BSC use as part of its review of research and teaching protocols involving biohazardous materials. Office of Safety provides technical support, training, and administration of the certification and decontamination program described in this policy.

PROCEDURES

Selecting and Purchasing a Biosafety Cabinet

Before purchasing a BSC, the PI or laboratory supervisor must contact the Office of Safety to discuss the intended use, agents involved, and required BSC class/type. The Office of Safety will advise on appropriate cabinet selection based on the risk assessment and applicable Biosafety Level.

Upon delivery, the cabinet must be placed in its permanent location, with all packing materials removed, and must not be used until certified. The purchasing lab must schedule initial certification with the Office of Safety before any biohazardous work begins.

Certifying a Biosafety Cabinet

BSCs must be certified:

- a. upon initial installation;
- b. any time the cabinet is moved or relocated;
- c. after major repair or HEPA filter replacement; and
- d. at minimum, annually.

The Office of Safety will annually certify the BSC and the laboratory or department is responsible for funding parts and/or repairs through a certifier holding current NSF/ANSI 49 accreditation. Certification records will be retained by the Office of Safety and made available upon request.

If a cabinet fails certification, it must be immediately labeled "Not Certified – Do Not Use" and removed from active service until repaired and successfully re-certified.

Using a Biosafety Cabinet

Personnel must complete biosafety training, including BSC-specific instruction, before using a cabinet independently.

1. Turn on the blower and cabinet lighting and allow the cabinet to purge for a minimum of five minutes before beginning work.
2. Load only the materials needed for the procedure; do not block the front air grille or overload the work surface.
3. Do not use open flames in Class A1 or A2 cabinets. If flame sterilization is required and approved, use only a touch-plate micro-burner.
4. Disinfect all work surfaces and equipment inside the cabinet before and after each use with an approved disinfectant.
5. Do not use the top of the cabinet for storage, as this can damage the HEPA filter housing.

Decontaminating, Relocating, or Disposing of a Biosafety Cabinet

Contact the Office of Safety **before** relocating, repairing, or disposing of any BSC. An external vendor approved by the Office of Safety must perform full internal decontamination (e.g., vaporized hydrogen peroxide fumigation, or an approved alternative) before the cabinet is moved, opened for repair, or removed from service. The Office of Safety must approve any alternative decontamination method prior to use.

Decontamination must be documented, and the completed decontamination form must be attached to the cabinet before it leaves the laboratory.

Reporting Malfunctions or Incidents

Any suspected malfunction, alarm activation, or containment failure must be reported immediately to the laboratory supervisor and to the Office of Safety. The cabinet must be taken out of service and labeled accordingly until inspected and, if necessary, recertified.

Spills or exposures involving a BSC must be reported and managed according to the laboratory procedure.

RESPONSIBILITIES

Principal Investigator / Laboratory Supervisor	• Ensure BSCs under their control are certified, properly used, decontaminated, and maintained • Ensure personnel are trained before independent use • Maintain certification and decontamination records; reports malfunctions and incidents to Office of Safety
Laboratory Personnel / Students	• Complete required biosafety and BSC-specific training • Operate and decontaminate the BSC according to this policy • Report malfunctions or spills immediately
Office of Safety	• Approve certifiers and alternative decontamination methods • Provide training resources • Maintain records of cabinet certification status • Assist with cabinet selection and troubleshooting
Institutional Biosafety Committee (IBC)	• Review and approves research/teaching protocols requiring BSC use • Establish and update biosafety-related requirements; investigates reported incidents involving biohazardous materials
Facilities Management	• Provide utility connections (electrical, gas, vacuum) as required • Does not service internal BSC components (e.g., blowers, HEPA filters) without Office of Safety authorization
Deans, Directors & Department Heads	• Ensure adequate resources are available for BSC certification, maintenance, and compliance within their units • Support enforcement of this policy

RELATED INFORMATION

- [Centers for Disease Control & Prevention \(CDC\)](https://www.cdc.gov/biosafety/)

- [CDC Biosafety in Microbiological and Biomedical Laboratories](#)
- [National Institutes of Health \(NIH\)](#)
- [National Sanitation Foundation \(NSF\)](#)
- [NSF/ANSI 49 Standard: Biosafety Cabinetry Certification](#)
- [OSHA Laboratory Safety Biosafety Cabinet Fact Sheet](#)
- [UND Institutional Biosafety Manual](#)
- [UND Laboratory Specific Safety Manual](#)

FORMS

- Laboratory Equipment Decontamination Form (see Attachments)

APPENDICES

There are no appendices associated with this policy.

Attachments

[Laboratory Equipment Decontamination Form](#)

Approval Signatures

Step Description	Approver	Date
Campus Comment	Jennifer Rogers: Director of University Policy	Pending
Executive Council (1st Reading)	Jennifer Rogers: Director of University Policy	09/2026
Policy Advisory Group	Jennifer Rogers: Director of University Policy	09/2026
Policy Office	Jennifer Rogers: Director of University Policy	07/2026
Policy Owner	Kristie Adams: Lab & Research Safety Officer	07/2026
DPS Review	Marcus Simpson: Director for Safety	07/2026

References

CDC, NIH, NSF/ANSI, OSHA, UND Procedure

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