

# Environmental Health & Safety

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## Biohazards

### 1. Scope

The majority of the criteria presented in this chapter are taken from Biosafety in Microbiological and Biomedical Laboratories (BMBL), 6th Edition authored by the Centers for Disease Control and Prevention (CDC) and the National Institutes of Health (NIH). The criteria presented in this chapter are for general-use Biosafety Containment Levels 1, 2, and 3 for biological research laboratories. If vertebrate animals are involved in research with biohazardous materials, requirements of animal biosafety laboratories (ABSL), also provided in the BMBL, will apply as well. Furthermore, this chapter does not include specific requirements of the NIH Guidelines for Recombinant DNA research that could apply to research involving recombinant or synthetic nucleic acids, transgenic plants, large-scale culture of biohazards, etc.

### 2. Basic Laboratory Design for Bio-Safety Level 1

- a. Each laboratory should have doors to control access.
- b. Each laboratory must have a sink for hand washing.
- c. An eyewash station must be readily available. [See Section 4 for design details.](#)
- d. The laboratories should be designed for easy cleaning.
- e. Carpets and rugs shall not be used.
- f. Spaces between furniture and equipment should be accessible for cleaning.
- g. Furniture must be covered with a non-porous material for easy cleaning.
- h. Laboratory Furniture must be capable of supporting anticipated loads and uses.
- i. Bench tops shall be impervious to water, and resistant to acids, alkalis, organic solvents, and moderate heat.
- j. Approved methods for decontamination of infectious or regulated laboratory wastes shall be available (e.g., autoclave, chemical disinfection or other decontamination procedure approved by the University Biosafety Officer (BSO) or designee).
- k. Windows shall be fixed and not operable unless existing condition requires them to open for ventilation. If operable, they must be fitted with screens.

### 3. Basic Laboratory Design for Bio-Safety Level 2

In addition to the requirements for a BSL 1 laboratory, the following are required:

- a. Doors should be self-closing and have locks in accordance with institutional policies.
- b. The sink for hand washing should be located near the exit door.
- c. Vacuum lines should be protected with High Efficiency Particulate Air (HEPA) filters. The preferred location of the HEPA filter is in the lab so as to minimize contamination of vacuum lines. If managed by lab, ensure system design supports this approach.

- d. An approved method for decontaminating all laboratory wastes should be available in the facility. Optimize location to minimize travel distance for users.

#### 4. Biological Safety Cabinets

- a. Review EH&S website at <https://www.ehs.washington.edu/biological/biological-safety-cabinets> for information concerning BSC selection, location, procurement, and certification.
- b. Locate the biological safety cabinets (BSC) away from doors, operable windows, high-traffic, ventilation diffusers and other possible airflow disruptions; use a guideline of six feet of separation.
- c. Provide a minimum of six feet of clearance between BSCs installed directly opposite another.
- d. Do NOT plumb the BSCs with natural gas.
- e. Provide at least ten inches of clearance above a recirculating Class II A2 BSC; this is to facilitate decontamination of the exhaust HEPA filter.
- f. Provide at least four inches of clearance behind and on the non-utility side, and six inches clearance on the utility side of the cabinet.
- g. Provide a NEMA 5-20 (20-amp) receptacle located high so that unit may be easily unplugged for servicing.
- h. Specify BSC to be seismically anchored per manufacturer recommendations and include seismic braces and other necessary components in the purchase.
- i. Biosafety cabinets must be certified by University EH&S technicians prior to substantial completion and use. This should be scheduled directly with the EH&S technician at least 2 weeks prior to required certification date.
- j. [See Ventilation Chapter for guidelines for venting BSCs.](#)