

**Personal Protective Equipment (PPE) Matrix  
Guidelines for Biosafety & Chemical PPE**

Engineering controls and good safety practices are always required in laboratories. PPE alone should not be relied upon to control hazards when other effective controls are available. PPE must be used correctly and consistently to be effective.

In order to determine whether and what PPE is needed, the employer (the PI/supervisor) must “assess the workplace to determine if hazards are present, or are likely to be present, which necessitate the use of [PPE],” 29 CFR 1910.132(d)(1).

William & Mary safety data sheets can be found through the link to our electronic library here:

<https://www.wm.edu/offices/publicsafety/ehs/hazard/safetydatasheets/index.php>

A work area and process/task assessment is required to determine the potential hazards and the appropriate PPE. The PI/supervisor shall enforce the use of required PPE. Below are guidelines and not intended to replace or take precedence over a hazard assessment. For any assistance with hazard identification, contact [safety@wm.edu](mailto:safety@wm.edu).

**Personal Protective Equipment (PPE) for Biosafety Labs**

<b>Biosafety Level →</b>	<b>BSL 1</b>	<b>BSL 2</b>
Face	Protective eyewear shall be worn for conduct of procedures in which splashes of microorganisms or other hazardous materials are possible.	Face protection (goggles, mask, face shield or other splatter guard) is used for anticipated splashes or sprays of infectious or other hazardous materials to the face when the microorganisms must be manipulated outside a biosafety cabinet (BSC) or vented balance safety enclosure (VBSE).  Eye protection must be decontaminated after use.
Hands	Gloves must be worn when working with BSL1 materials. Where chemical hazards require hand protection in biosafety labs, consult the Safety Data Sheet (SDS) and/or the EH&S Office at <a href="mailto:safety@wm.edu">safety@wm.edu</a> for chemical-specific glove selection. See also: <a href="https://www.wm.edu/offices/publicsafety/ehs/laboratory-research/chemistry-safety/index.php">https://www.wm.edu/offices/publicsafety/ehs/laboratory-research/chemistry-safety/index.php</a>	Gloves must be worn when working with BSL2 materials or when potentially coming into contact with potentially contaminated surfaces or equipment. Wearing two pairs of gloves may be appropriate. Where chemical hazards require hand protection in biosafety labs, consult the Safety Data Sheet (SDS) and/or the EH&S Office at <a href="mailto:safety@wm.edu">safety@wm.edu</a> for chemical-specific glove selection. See also: <a href="https://www.wm.edu/offices/publicsafety/ehs/">https://www.wm.edu/offices/publicsafety/ehs/</a>

Biosafety Level →	BSL 1	BSL 2
Hands Cont.	Gloves are disposed of when overtly contaminated, and removed when work with infectious materials is completed or when the integrity of the glove is compromised. Disposable gloves are not washed, reused, or used for touching "clean" surfaces (keyboards, telephones, etc.), and they should not be worn outside the lab. Hands are washed immediately following removal of gloves.	<a href="https://www.wm.edu/offices/publicsafety/ehs/laboratory-research/chemistry-safety/index.php">laboratory-research/chemistry-safety/index.php</a>  Gloves are disposed of when overtly contaminated, and removed when work with infectious materials is completed or when the integrity of the glove is compromised. Disposable gloves are not washed, reused, or used for touching "clean" surfaces (keyboards, telephones, etc.), and they should not be worn outside the lab. Hands are washed immediately following removal of gloves.
Body	It is recommended that laboratory coats, gowns, or uniforms be worn to prevent contamination or soiling of street clothes. Lab coat laundering is coordinated through the EH&S Office. See also: <a href="https://www.wm.edu/offices/publicsafety/ehs/laboratory-research/lab-coat-service/index.php">https://www.wm.edu/offices/publicsafety/ehs/laboratory-research/lab-coat-service/index.php</a>	Protective laboratory coats, gowns, smocks, or uniforms designated for lab use must be worn when working with BSL2 materials. This protective clothing is removed and left in the laboratory before leaving for non-laboratory areas. All protective clothing is either disposed of in the laboratory or laundered by the University; it should never be taken home by personnel.  Lab coat laundering is coordinated through the EH&S Office. See also: <a href="https://www.wm.edu/offices/publicsafety/ehs/laboratory-research/lab-coat-service/index.php">https://www.wm.edu/offices/publicsafety/ehs/laboratory-research/lab-coat-service/index.php</a>
Feet	Closed-toed shoes with backs are required.	Closed-toed shoes with backs are required.

Reference: <https://www.cdc.gov/labs/BMBL.html>

	Minimum Protection	Potential requirements based on hazard assessment
Face	Safety glasses with side shields are required. They must be marked with “Z87” to signify adherence to ANSI Z87.1. These protect against minimal splashes or impact from debris.	<p>Goggles are required for protection against splashes and chemical vapors. They are rated D3 (resistant to liquid splashing), D4 (protected against most dust), and D5 (resistant against the finest dust). Choose the goggles that are right for the task.</p> <p>Face shields are required when there is a splash hazard – e.g. when dispensing cryogenics or pouring large volumes of hazardous liquids. Safety glasses or goggles MUST be worn under a face shield.</p> <p>When working around lasers, certified LEP eyewear must be used. This is labeled with its optical density and wavelength or wavelength range the eyewear is designed for. This must match the wavelength the user is working with.</p>
Hands	Disposable nitrile gloves provide limited protection and shall be removed immediately when contaminated.	<p>When working with hazardous chemicals consult the Safety Data Sheet (SDS) and/or the EH&amp;S Office at <a href="mailto:safety@wm.edu">safety@wm.edu</a> for chemical-specific glove selection. Wearing two pairs of gloves may be appropriate. See also:  <a href="https://www.wm.edu/offices/publicsafety/ehs/laboratory-research/chemistry-safety/index.php">https://www.wm.edu/offices/publicsafety/ehs/laboratory-research/chemistry-safety/index.php</a></p> <p>Use the link titled “Chemical protective gloves selection.”</p>

<p>Body</p>	<p>Long sleeves are required for working with all chemicals in the lab. Lab coats are supplied and laundered by the University and should never be taken home for laundering</p>	<p>When identified, lab coats shall be worn to protect clothing from becoming soiled and protect the user in case of minor splashes of chemicals. This protective clothing is removed and left in the laboratory before leaving for non-laboratory areas. All protective clothing is either disposed of in the laboratory or laundered by the University; it should never be taken home by personnel.</p> <p>Lab coat laundering is coordinated through the EH&amp;S Office.</p> <p>Fire-resistant lab coats (blue Nomex) should be used when handling large quantities of flammable liquids and/or lab work where flame flashback is likely.</p> <p>Long pants are recommended in all laboratories at all times.</p> <p>Vinyl or rubber aprons with sleeves should be used when dispensing certain corrosive liquids.</p>
<p>Feet</p>	<p>Closed-toed shoes with backs are required.</p>	<p>Closed-toed shoes with backs are required.</p>