Laboratory PPE Hazard Assessment

This assessment must be completed online at **https://ehsis.yale.edu/EHSIntegrator/Survey/LabPPE.** All Activities/Jobs/tasks that apply to your laboratory must be noted.

Personal Protection Equipment (PPE) Requirements

*Please note that safety glasses also includes ANSI approved prescription glasses with sideshields

General PPE – To Be Worn at All Times

Applies	Activities/Jobs/Tasks	Potential Exposures Addressed by PPE	Personal Protective Equipment Requirements
✓	Working in a laboratory where hazardous materials are used (*exception: safety glasses are not required when sitting at a desk in the lab that is separated from the bench and there is minimal possibility of contamination*)	• Contamination (feet, leg, clothing, eyes, hands)	• Closed-toe, solid top shoes • Clothing that covers the legs • Safety glasses* or prescription glasses • Gloves if touching potentially contaminated equipment

Task-Specific PPE Requirements

Applies	Activities/Jobs/Tasks	Potential Exposures Addressed by PPE	Personal Protective Equipment Requirements
	Directly handling hazardous materials	• Chemical, biological or radioactive material contamination (hands, eyes) • Contamination of personal clothing or skin (body)	• Safety glasses • Gloves—exam style nitrile (highly permeable and/or highly toxic materials may require different gloves—contact EHS) • Lab coat

Applies	Activities/Jobs/Tasks	Potential Exposures Addressed by PPE	Personal Protective Equipment Requirements
	Working with larger volumes of flammable liquids (>4L) or heating flammable liquids	• Splashing (eyes/face) • Fire/burns (eyes, face, hands, arms, body)	• Safety glasses • Gloves – exam style nitrile • Flame resistant lab coat
	Working with larger volumes (>1L) of corrosive or toxic liquids	• Splashing (eyes, face) • Contamination/burns to unprotected skin (hands, wrists, body)	• Chemical goggles • Face shield if under pressure or outside fume hood • Gloves—utility grade nitrile or neoprene over nitrile exam style • Lab coat
	Working directly with pyrophoric and water reactive chemicals	• Burns (clothing, eyes, face, hands, body)	• Wear non-synthetic clothing • Safety glasses or chemical goggles • Face shield if splashing can occur • Nitrile gloves • Flame resistant gloves (larger volumes) • Flame resistant lab coat
	Working with cryogenic materials	• Cold burns (eyes, face, hands, body)	• Safety glasses • Face shield (larger volumes) • Thermal insulated gloves • Lab coat, apron or equivalent (larger volumes)
	Working with hot objects or equipment	• Burns (eyes, face, hands, arms, body)	• Safety glasses • Face shield as necessary • Heat resistant gloves (with arm protection if needed) • Lab coat, apron or equivalent
	Working with open flames	• Burns (eyes, face, hands, arms, body)	• Safety glasses • Gloves – exam style nitrile • Flame resistant lab coat

Applies	Activities/Jobs/Tasks	Potential Exposures Addressed by PPE	Personal Protective Equipment Requirements
	Working with apparatus under high pressure	• Cuts from glass/ material fragments (face, hands, body) • Chemical contamination (eyes, face, hands, body)	• Safety glasses or goggles • Face shield • Utility gloves • Chemical resistant apron as necessary
	Working with highly reactive or explosive chemicals	• Cuts from glass/ material fragments (face, hands, body) • Chemical contamination (eyes, face, hands, body) • Fire	• Work only inside a chemical fume hood • Goggles • Face shield • Utility grade gloves—neoprene, butyl, nitrile, nomex, cut resistant, as appropriate • Flame resistant lab coat when fire hazard exists • Chemical resistant apron
	Minor chemical spill cleanup (if <1 liter of low hazard chemical, and respiratory protection is not required)	• Chemical contamination (shoes, eyes, hands, clothing)	• Shoe covers as necessary • Safety glasses or goggles • Double nitrile gloves or utility grade gloves over nitrile exam gloves • Lab coat
	UV light sources	• Burns (eyes, face, neck, hands, wrist)	• Full face shield (polycarbonate) over safety glasses • Nitrile gloves (wrists fully covered) • Lab coat
	Handling animals in a laboratory	• Animal blood and other potentially infectious materials (eyes, hands) • Bites, scratches (hands, forearms, body) • Allergens (respiratory or transfer to mucous membranes of the eyes, nose or mouth) • Anesthetic agents (respiratory)	• Safety glasses • Gloves • Gown or lab coat • Refer to YARC for additional PPE requirements, which may differ depending on species, engineering controls, and hazardous agents used

Applies	Activities/Jobs/Tasks	Potential Exposures Addressed by PPE	Personal Protective Equipment Requirements
	Working with radioactive materials	• Contamination of personal clothing (body) • Radioactive material contamination (eyes, hands, wrists, skin)	• Safety glasses • Gloves (double gloves recommended) • Lab coat • Personal radiation badge as appropriate • Survey meter as appropriate • Bench-top radiation shielding as appropriate
	Performing an iodination with volatile radioactive sodium iodide inside an approved radioiodine fume hood	• Contamination of personal clothing (shoes, body) • Radioactive material contamination (eyes, hands, wrists, skin) • Inhalation of volatile material (respiratory)	• Shoe covers • Safety glasses* • Double gloves • Sleeve covers • Lab coat • Personal radiation badge • Survey meter with scintillation probe • Benchtop radiation shielding
	Operating analytical or diagnostic x-ray generating equipment (fluoroscopy, XRD, XRF, patient procedures, etc.)	• Radiation exposure (body) • If patient or human subject, standard precautions • If laboratory animals, allergens (respiratory or transfer to mucous membranes of the eyes, nose or mouth)	• Lead apron or use of structural radiation shielding as appropriate • Personal radiation badge and ring if assigned • Survey Meter as appropriate • Gloves, as appropriate • Lab coat, gown or approved uniform, as appropriate
	Working with open table Class 3B or 4 Lasers	• Ocular and skin exposure (eyes, face, hands, body)	• Protective eyewear of proper optical density • Face shield for UV Lasers • Appropriate gloves for UV lasers • Lab coat for UV lasers • No jewelry or reflective items worn
	Working at a microscope in the laboratory	• Hazardous material contamination (hands) • Contamination of personal clothing (body)	• (If necessary, safety glasses may be temporarily removed while viewing materials via a microscope) • Gloves if touching potentially contaminated material • Lab coat or gown

Applies	Activities/Jobs/Tasks	Potential Exposures Addressed by PPE	Personal Protective Equipment Requirements
	Using an autoclave	• Contamination/burns (eyes, face, hands, body)	• Lab coat • Face shield • Heat resistant apron • Heat resistant gloves
	Working when exposed to fall hazards (4 feet or greater without guardrails)	• Fall to lower level (body)	• Active fall protection (requires site specific training)
Biohazard experiments are classified based on risk. The starting point for risk assessment is the assignment of a biohazard to a specific Risk Group. There are 4 Risk Groups (RGs) based on risk to the individual and the community. RG1 is the lowest risk and RG4 is the highest. Risk Group assignments for human pathogens can be accessed at: http://www.absa.org/riskgroups/index.html • For other experiments, researchers can refer to the Gradations of Risk Table referenced in this document.			
	Work with Risk Group 1 materials that do not cause disease in humans (i.e. non-pathogenic strains of E. coli, *Bacillus subtillus*, *Saccharomyces cerevisiae*, rodent cell lines)	• Risk Group 1 materials could represent a risk to individuals with compromised immunity or who may have allergies to the materials (eyes, hands, respiratory, body)	• Safety glasses • Gloves • Lab coat • Surgical mask or respirator, if specified
	Working with human blood, tissues, body fluids, human cell lines, or Risk Group 2 bloodborne pathogens, utilizing Universal Precautions and BSL2 containment.	• Potentially infectious materials by splash (to mucous membranes of the eyes, nose or mouth, or through non-intact skin) • Puncture by contaminated sharps (skin—percutaneous)	• Safety glasses • Mask or face shield if splashing is possible • Gloves—nitrile exam and/or cut-resistant • Lab coat or gown • Surgical mask or respirator, if specified • Additional PPE may be required based on risk to the individual

Applies	Activities/Jobs/Tasks	Potential Exposures Addressed by PPE	Personal Protective Equipment Requirements
	Experiments involving Risk Group 2 agents, that represent a moderate risk to the individual and may cause disease of varying severity. Examples of Risk Group 2 agents include *Plasmodium falciparum, Salmonella typhimurium*, Herpes Simplex Virus and *Cryptococcus neoformans*)	• Exposure to agent (eyes, hands, skin) • Puncture by contaminated sharps (skin—percutaneous) • Ingestion (eyes, nose or mouth) • Aerosol production can create potential risk of inhalation and contamination of surrounding surfaces (respiratory)	• Safety glasses • Gloves • Lab coat or gown • Respirator, if specified • Additional PPE may be required based on risk to the individual • Confine aerosols as close as possible to their point of generation • Use a biosafety cabinet or other engineering control
	Experiments with Risk Group 3 agents (i.e. West Nile Virus, *Mycobacterium tuberculosis, Histoplasma capsulatum)* in cell culture or animal laboratories	• All RG2 routes of exposure may be applicable (eyes, nose, mouth, hands, respiratory, skin) • Inhalation is of particular concern for pathogens classified at Risk Group 3 (respiratory)	• All work with RG3 agents must be conducted under primary containment using BSL3 containment practices. Specialized laboratories are required for this work. • **All procedures with RG3 agents must be approved by the Yale Biological Safety Committee** • Full face protection—face shield or safety glasses and mask • Gloves—exam, two pairs • Gown—back-fastening • Additional PPE may be required based on risk to the individual, such as respiratory protection, protective sleeve covers, booties, jump suits, etc.
	Performing work with Risk Group 4 agents (i.e. Ebola virus, Marburg virus) or work that requires BSL4 containment. Risk Group 4 agents represent a very high risk to the individual and are also a risk to the community.	• All routes of exposure (percutaneous, inhalation, ingestion, and via facial mucous membranes) may be involved with these experiments.	• **Work with Risk Group 4 Agents is not allowed at Yale University.**