**LAB PPE HAZARD ASSESSMENT GUIDE**

**Purpose and Description**

The laboratory personal protective equipment (PPE) hazard assessment guide will help the user identify hazards to which laboratory personnel may be exposed and specifies the minimal appropriate PPE to protect against these hazards during work operations. When completed, the document and its associated review and training with lab personnel will satisfy the Department of Labor and Industries requirements for PPE as required in Washington Administrative Code (WAC) 296-800-160.

This document must be completed by the Principal Investigator (PI), Lab Supervisor, or their designee. This person must conduct a laboratory PPE hazard assessment that is specific to operations in their laboratories. EHS personnel are available to assist with the hazard assessment and can review the form. EHS may be consulted by calling 360-650-3064 or emailing ehs@wwu.edu. Faculty and laboratory leadership staff are responsible for ensuring PPE requirements are followed.

**Section 1: Instructions and Guidance on PPE Selection**

The Principal Investigator, Lab Supervisor, or their designee will conduct and certify the hazard assessment.

1. Conduct a hazard assessment of the laboratory operations using the PPE Assessment Guide.

* This guide will assist in identifying work tasks that require the use of PPE to protect lab personnel from exposures to hazards. If a listed task is performed, check the applicable box for “Yes”. If not, check the applicable box for “No”. As needed, add tasks to the list to customize it for your laboratory operations.
* For each task performed, as necessary, provide additional information by marking the appropriate additional box or marking “Other PPE: Specify” and describing in the space provided the lab specific PPE designated for the work task.

**GENERAL GUIDANCE ON PERSONAL PROTECTIVE EQUIPMENT (PPE) SELECTION**

1. **Minimum Laboratory PPE.** In general, the minimum PPE that should be worn while performing laboratory work is the following:

* Safety glasses
* Disposable nitrile or other appropriate gloves
* Lab coat (full length) and long pants, long skirt, or equivalent leg covering (no shorts)
* Laboratory footwear (as described below)

1. **Chemical-Resistant Gloves**. Chemical-resistant gloves must be selected based on the specific chemical(s) used and manufacturer’s glove permeation and compatibility charts. When determining the appropriateness of gloves for your laboratory you must use data provided the manufacturer of the specific gloves you are using. It is important to consider the potential contact time and procedure for handling gloves that have been contaminated with specific chemicals. For example, when handling acetonitrile (a flammable and toxic solvent), it is acceptable to wear a 6 mil nitrile glove **only** if procedure is to immediately remove and dispose of gloves upon contamination as the permeation and breakthrough time are extremely short. If there is the need or potential for longer exposure, different gloves such as 14 mil butyl gloves may be warranted. There are a number of glove selection resources available on the web or reach out to EHS for advice.
2. **Laboratory Footwear.** Laboratory footwear should fully cover the feet to protect against chemical spills. Avoid sandals, flip flops, flats, canvas/breathable fabric tops, and shoes constructed of mesh (such as athletic shoes) unless impervious chemical-resistant booties that protect the entire foot are worn over them.
3. **Airborne / Inhalation Hazard: Engineering Controls and Respiratory Protection**.

* **Chemical Fume Hood**. When materials have a potential for becoming airborne, use a chemical fume hood or other engineering control whenever possible. Activities that generate airborne contaminants or odors that are not conducted inside of a chemical fume hood or using some other engineering control (such as a local exhaust at the workbench) should be evaluated to determine if the activity presents an inhalation hazard.
* **Biological Safety Cabinet**. When handling Risk Group 2 (RG-2) agents/materials, it is best practice to handle inside of a biosafety cabinet. All manipulations that will produce aerosols such as vortexing and mixing, and handling of any known airborne pathogens, must be done in a biosafety cabinet. Centrifuges may be operated outside of a biosafety cabinet with RG-2 agents if they are used with sealed rotors or safety caps, otherwise they must be used within the biosafety cabinet.
* **Respiratory Protection**. If a need for respiratory protection is identified during the hazard assessment, a respiratory protection program must be implemented that includes a hazard assessment, medical evaluation to wear a respirator, respirator training, and respirator fit testing. Contact EHS at 650-3064 for assistance in developing the program.

| **Chemical Hazards** | | | |
| --- | --- | --- | --- |
| **Task Performed**  **Yes No** | **Task Performed in Lab**  **(Modify wording to fit your needs)** | **Potential Hazards** | **PPE Designated For Lab Specific Tasks** |
|  | C1. Working with solids of low or moderate toxicity.  (Typically Category 4 toxicity ratings on the SDS, or Category 1 health hazards on the NFPA diamond) | * Skin damage * Eye damage * Toxic by skin contact | * **Eyes:** Safety glasses * **Hands:** Disposable nitrile or appropriate chemical resistant gloves * **Body:** Lab coat; Long pants, long skirt, or equivalent leg covering (no shorts); lab footwear (Refer to Page 3).   **Face**: Splash or splatter may occur - Face shield  **Other PPE, Specify:** |
|  | C2. Working with small volumes (<100 ml.) of corrosive (acids or caustics) liquids or solids. | * Skin damage * Eye damage   Toxic by skin contact | * **Eyes:** Safety glasses * **Hands:** Disposable nitrile or appropriate chemical resistant gloves * **Body:** Lab coat; Long pants, long skirt, or equivalent leg covering (no shorts); lab footwear (Refer to Page 3).   **Other PPE, Specify:** |
|  | C3. Working with large volumes of corrosive (acids or caustics) or \*acutely toxic materials that may splash.  (\*Typically materials that have category 2 or 3 toxicity ratings on SDS sheets) | * Inhalation * Skin damage * Eye damage * Toxic by skin contact | * **Eyes:** Safety goggles * **Face:** If splash or splatter may occur – Face shield * **Hands:** Disposable nitrile or appropriate chemical resistant gloves * **Body:** Lab coat; Long pants, long skirt, or equivalent leg covering (no shorts); lab footwear (Refer to Page 3).   **Body:** Chemical resistant apron.  **Inhalation:** Respiratory protection. *Contact EHS for respiratory protection program assistance.*  **Other PPE, Specify:** |
|  | C4. Working with small volumes (<100 ml.) of flammable solvents or materials. | * Skin damage * Eye damage * Toxic by skin contact | * **Eyes:** Safety glasses * **Hands:** Disposable nitrile or appropriate chemical resistant gloves * **Body:** Lab coat; Long pants, long skirt, or equivalent leg covering (no shorts); lab footwear (Refer to Page 3).   **Other PPE, Specify:** |
|  | C5. Working with large volumes (>100 ml.) of flammable solvents. | * Inhalation * Skin damage * Eye damage * Toxic by skin contact * Fire | * **Eyes:** Safety glasses * **Hands:** Disposable nitrile or appropriate chemical resistant gloves * **Body:** Lab coat; Long pants, long skirt, or equivalent leg covering (no shorts); lab footwear (Refer to Page 3).   **Face**: Splash or splatter may occur - Face shield  **Body:** Flame resistant lab coat  **Inhalation:** Respiratory protection. *Contact EHS for respiratory protection program assistance.*  **Other PPE, Specify:** |
|  | C6. Working with chemicals of high acute toxicity (e.g. hydrogen fluoride, hydrogen cyanide).  (Typically chemicals with a category 1 acute toxicity rating on SDS sheets. These substances often have unique spill cleanup, first aid, and/or handling measures. In addition to PPE, these substances often require lab specific SOPs and training for their safe use) | * Inhalation * Skin damage * Eye damage * Toxic by skin contact | * **Eyes:** Safety glasses * **Hands:** Disposable nitrile or appropriate chemical resistant gloves * **Body:** Lab coat; Long pants, long skirt, or equivalent leg covering (no shorts); lab footwear (Refer to Page 3).   **Eyes**: Safety goggles  **Face**: Splash or splatter may occur - Face shield  **Inhalation:** Respiratory protection. *Contact EHS for respiratory protection program assistance.*  **Other PPE, Specify:** |
|  | C7. Working with particularly hazardous agent such as:   * Human carcinogen. * Mutagen. * Reproductive toxin. | * Inhalation * Skin damage * Eye damage * Toxic by skin contact | * **Eyes:** Safety glasses * **Hands:** Disposable nitrile or appropriate chemical resistant gloves. Double glove. * **Body:** Lab coat; Long pants, long skirt, or equivalent leg covering (no shorts); lab footwear (Refer to Page 3)   **Eyes**: Safety goggles  **Face**: Splash or splatter may occur - Face shield  **Inhalation:** Respiratory protection. *Contact EHS for respiratory protection program assistance.*  **Other PPE, Specify:** |
|  | C8. Working with air or water reactive chemicals | * Exposure to toxic gases, heat, and/or energy * Inhalation * Skin damage * Eye damage * Fire | * **Eyes:** Safety goggles * **Hands:** Disposable nitrile or appropriate chemical resistant gloves * **Body:** Lab coat; Long pants, long skirt, or equivalent leg covering (no shorts); lab footwear (Refer to Page 3).   **Face**: Splash or splatter may occur - Face shield  **Hands**: Heat resistant or chemical resistant gloves. Specify under other PPE.  **Body:** If fire hazard, flame-resistant lab coat  **Inhalation:** Respiratory protection. *Contact EHS for respiratory protection program assistance.*  **Other PPE, Specify:** |
|  | C9. Working with pyrophoric materials. | * Fire * Severe burns * Inhalation * Skin damage * Eye damage | * **Eyes**: Safety goggles * **Hands**: Inner disposable nitrile or appropriate chemical resistant gloves * **Hands:** Outer heat-resistant gloves * **Body:** Flame resistant lab coat; Long pants, long skirt, or equivalent leg covering (no shorts); lab footwear (Refer to Page 3) * **Body:** Synthetic clothing must not be worn when working with pyrophoric materials   **Face**: Splash or splatter may occur – Face shield  **Other PPE, Specify**: |
|  | C10. Working with potentially explosive chemicals. | * Detonation * Flying debris * Skin damage * Eye damage * Fire | * **Eyes**: Safety goggles * **Hands**: Inner disposable nitrile or appropriate chemical resistant gloves * **Hands:** Outer heat-resistant gloves * **Body:** Flame resistant lab coat; Long pants, long skirt, or equivalent leg covering (no shorts); lab footwear (Refer to Page 3) * **Body:** Synthetic clothing must not be worn when working with explosive materials   **Face**: Splash or splatter may occur – Face shield  **Eyes, Face, or Body**: For high risk activities - Blast shield  **Other PPE, Specify**: |
|  | C11. Working with high temperature equipment or objects. | * Burns * Fire | * **Eyes**: Safety goggles * **Hands**: Inner disposable nitrile or appropriate chemical resistant gloves * **Hands:** High temperature thermal insulated gloves * **Body:** Flame resistant lab coat; Long pants, long skirt, or equivalent leg covering (no shorts); lab footwear (Refer to Page 3) * **Body:** Synthetic clothing must not be worn when working with high temperature equipment or objects   **Face**: Splash or splatter may occur – Face shield  **Other PPE, Specify**: |
|  | C12. List any other particularly hazardous lab task involving chemicals. | Conduct risk assessment: Hazard depends on task and chemical properties   * Inhalation * Skin damage * Eye damage | * **Eyes:** Safety glasses * **Hands:** Disposable nitrile or other appropriate chemical resistant gloves * **Body:** Lab coat; Long pants, long skirt, or equivalent leg covering (no shorts); lab footwear (Refer to Page 3).   **Face**: Splash or splatter may occur – Face shield  **Body**: Chemical resistant apron  **Inhalation:** Respiratory protection. *Contact EHS for respiratory protection program assistance.*  **Other PPE, Specify:** |
|  | C13. Minor (or small) spill cleanup.  Spill can be cleaned up with standard spill kit. | * Inhalation * Skin damage * Eye damage | * **Eyes**: Safety goggles * **Face**: Splash or splatter may occur - Face shield * **Hands**: Chemical-resistant gloves for spill cleanup * **Body:** Lab coat; Long pants, skirt, or equivalent leg covering (no shorts); lab footwear (Refer to Page 3) * As needed, contact EHS for assistance   **Foot:** Shoes covers  **Other PPE, Specify**: |
|  | C14. Large spill cleanup.  Spill is too large or complex to clean up with standard spill kit. | * Inhalation * Skin damage * Eye damage | * **Mandatory: Follow Required Procedure** * If possible, stop or contain the release * Evacuate and secure the area * Assist injured or contaminated persons * Call 911 for assistance: Report injuries, fires, or request cleanup assistance * Call EHS for assistance |
|  | C15. Working with bound or wet nanomaterials | * Inhalation * Skin damage * Eye damage * Chemical exposure | * **Eyes:** Safety glasses * **Face**: Splash or splatter may occur – Face shield * **Hands**: Disposable nitrile or other appropriate chemical resistant gloves * **Hands**: Routinely replace gloves to minimize exposure and hand contamination * **Body:** Lab coat; Long pants, long skirt, or equivalent leg covering (no shorts); lab footwear (Refer to Page 3)   **Other PPE, Specify**: |
|  | C16. Working with unbound or dry engineered nanomaterials. | * Inhalation * Skin damage * Eye damage * Chemical exposure | For unbound or dry material:   * **Eyes:** Safety glasses * **Face**: Splash or splatter may occur – Face shield * **Hands**: Disposable nitrile or other appropriate chemical resistant gloves * **Hands**: Routinely replace gloves to minimize exposure and hand contamination * **Body:** Lab coat made of non-woven fabric and elastic at the wrists; Long pants, long skirt, or equivalent leg covering (no shorts); lab footwear (Refer to Page 3) * **Inhalation:** Half face respirator with P100 cartridge if working with aerosolizing nanomaterials outside of a vented work enclosure. *Contact EHS for respiratory protection program assistance.* * **Removal of PPE:** Give special attention to technique used to remove and dispose of contaminated PPE to avoid skin contact   **Other PPE, Specify**: |
|  | C17. |  |  |

| **Biological Hazards** | | | |
| --- | --- | --- | --- |
| **Task Performed**  **Yes No** | **Task Performed in Lab**  **(Modify wording to fit your needs)** | **Potential Hazards** | **PPE For Lab Specific Tasks** |
| **☐** **☐** | B1. Work with Risk Group 1 agents. | * Exposure to biohazardous agents | * **Eyes**: Safety glasses * **Hands**: Disposable latex, nitrile, or appropriate gloves * **Hands**: Routinely replace gloves to minimize exposure and hand contamination * **Body:** Long pants, skirt, or equivalent leg covering (no shorts); lab footwear (Refer to Page 3)   **☐ Body**: Lab coat  **☐ Face**: Splash or splatter may occur - Face shield  **☐ Other PPE, Specify**: |
|  | B2. Work with Risk Group 2 agents or human or non-human primate blood, blood products, or ‘other potentially infectious materials’ (OPIM) (which includes *all* unfixed human cell lines). | * Exposure to biohazardous agents | * **Eyes**: Safety glasses * **Face**: *COVID-19 Pandemic-related control*. Disposable, fluid-resistant face mask; must be disposed of before leaving the lab * **Hands**: Disposable latex, nitrile, or appropriate gloves * **Hands**: Routinely replace gloves to minimize exposure and hand contamination * **Body:** Lab coat; Long pants, skirt, or equivalent leg covering (no shorts); lab footwear (Refer to Page 3)   **Face**: Splash or splatter may occur - Face shield  **Other PPE, Specify**: |
|  | B3. Removing cryo vials containing biohazardous agents from liquid nitrogen. | * Vials may explode upon rapid warming * Cuts to face/neck and frostbite to hands * Exposure to biohazardous agents | * **Eyes**: Safety glasses * **Face**: Face shield * **Hands**: Inner disposable latex, nitrile, or appropriate gloves * **Hands**: Outer cryogenic, temperature thermal insulated gloves * **Body:** Lab coat; Long pants, long skirt, or equivalent leg covering (no shorts); lab footwear (Refer to Page 3)   **Body:** Cryogenic apron  **☐ Other PPE, Specify**: |
|  | B4. Work with vertebrate animals | * Exposure to zoonotic agents * Exposure to animal allergens * Bites and scratches | * **Eyes**: Safety glasses * **Body:** Lab coat; Long pants, long skirt, or equivalent leg covering (no shorts); lab footwear (Refer to Page 3 * **Hands**: Disposable latex, nitrile, or appropriate gloves   **☐ Hands:** base layer of cut/bite resistant gloves  **☐ Inhalation:** N95 respirator if desired or have allergy concerns. *Contact EHS for respiratory protection program assistance.*  **☐ Other PPE, Specify**: |
|  | B5. |  |  |

| **Physical Hazards** | | | |
| --- | --- | --- | --- |
| **Task Performed**  **Yes No** | **Task Performed in Lab**  **(Modify wording to fit your needs)** | **Potential Hazards** | **PPE For Lab Specific Tasks** |
|  | P1. Working with cryogenic liquids. | * Burns * Frostbite * Eye damage | * **Eyes**: Safety glasses * **Eyes:** For large volumes -Safety goggles * **Face**: Splash or splatter may occur - Face shield * **Hands**: Inner gloves - Disposable nitrile or appropriate chemical resistant gloves * **Hands**: Outer gloves: Cryogenic low temperature insulated gloves * **Body:** Lab coat; Long pants, skirt, or equivalent leg covering (no shorts); lab footwear (Refer to Page 3)   **Other PPE, Specify**: |
|  | P2. Working with very cold equipment or dry ice. | * Frostbite * Hypothermia | * **Eyes**: Safety glasses * **Body:** Lab coat; Long pants, long skirt, or equivalent leg covering (no shorts); lab footwear (Refer to Page 3 * **Hands**: Cryogenic low temperature insulated gloves   **☐ Other PPE, Specify**: |
|  | P3. Working with hot liquids.  Heating equipment (autoclave, hot plate, water bath, oil bath).  Open flames (Bunsen burner). | * Burns resulting in skin or eye damage | * **Eyes:** Safety glasses * **Hands:** Inner disposable nitrile or appropriate chemical resistant gloves * **Hands:** Outer thermal insulated gloves * **Body:** Lab coat; Long pants, long skirt, or equivalent leg covering (no shorts); lab footwear (Refer to Page 3) * **Eyes:** Safety goggles for work with hot liquids * **Face**: Splash or splatter may occur - Face shield * **Hands:** Autoclave gloves, impermeable insulated gloves for liquids amd steam   **☐ Other PPE, Specify**: |
|  | P4. Glassware washing. | * If glass breaks: Lacerations * Splash from cleaning agents | * **Eyes**: Safety glasses * **Hands**: Nitrile or appropriate chemical-resistant gloves * **Body:** Lab coat; Long pants, skirt, or equivalent leg covering (no shorts); lab footwear (Refer to Page 3)   **Face**: Face shield  **Hands:** If glass breaks, cut resistant gloves  **☐ Other PPE, Specify**: |
|  | P5. Working with loud equipment, noises, sounds, alarms, etc. | * Potential ear damage and hearing loss | * **Hearing:** Earplugs or ear muffs, as necessary:   **☐ Other PPE, Specify**: |
|  | P6. Working with an apparatus with contents under pressure or vacuum \_\_\_\_\_\_\_\_ (mm of Hg, psi, or torr). | * Explosion or implosion * Chemical exposure * Skin damage * Eye damage | * **Eyes**: Safety glasses * **Hands**: If chemicals used, nitrile or other appropriate chemical-resistant glove * **Body:** Lab coat; Long pants, skirt, or equivalent leg covering (no shorts); lab footwear (Refer to Page 3)   **Face**: Face shield  **Eyes and/or Face**: For high risk activities - Safety goggles and face shield  **Body:** If chemicals used, chemical-resistant apron  **Other PPE, Specify** |
|  | P7. Working with sharps or broken glass | * Cuts | * **For Cuts**: Use tongs for broken glass and designated sharps container for contaminated wastes * **For Cuts**: Cut resistant outer glove (Kevlar) with nitrile inner gloves   **☐ Other PPE, Specify**: |
|  | P8. Working with compressed gases i | * Asphyxiation * Toxic gas exposure * Significant energy release | * **Eyes**: Safety glasses * **Hands**: If chemicals used, nitrile or other appropriate chemical-resistant glove * **Body:** Long pants, skirt, or equivalent leg covering (no shorts); lab footwear (Refer to Page 3)   **Face**: Face shield  **Eyes and/or Face**: For high risk activities - Safety goggles and face shield  **Body:** If chemicals used, chemical-resistant apron  **Other PPE, Specify** |
|  | P9. Maintaining and repairing electrically powered equipment. | * Electrocution | * **Eyes**: Safety glasses * **Hands**: Insulated gloves * **Body:** Coveralls   **☐ Other PPE, Specify**: |
|  | P10. Rotating Equipment | Striking hazards  Caught in moving parts | * **Eyes**: Safety glasses * **Body:** Long sleeves with tight fitting cuffs, long pants or equivalent leg covering. Lab footwear * **Other**: Restrain hair, remove jewelry and no loose clothing.   **Gloves**:  **☐ Other PPE, Specify**: |
|  | P11. Saws and Cutting Equipment | Cuts/lacerations/  amputations | * **Eyes**: Safety glasses * **Body:** Long sleeves with tight fitting cuffs, long pants or equivalent leg covering. Lab footwear * **Other**: Restrain hair, remove jewelry and no loose clothing.   **Gloves**:  **☐ Other PPE, Specify**: |
|  | P12. Working with sharp sided materials or equipment. | Cuts/lacerations/  amputations | * **Eyes**: Safety glasses * **Body:** Long sleeves with tight fitting cuffs, long pants or equivalent leg covering. Lab footwear   **Gloves**: Leather or cut resistant Kevlar gloves  **☐ Other PPE, Specify**: |
|  | P13. Welding/Hot Work | Eye damage  Skin burns  Flash burns  Electric shock | * **Eyes**: Safety glasses * **Body:** Long sleeves with tight fitting cuffs, long pants or equivalent leg covering. Lab footwear   Welders hood, UV face shield and/or goggles with proper shades  Leather safety toed shoes  Head cover  Respirator with HEPA cartridges or supplied air if necessary  **Note:** Welding and hot work may only be conducted with a pre-authorization permit from EHS or in pre-approved areas. If you are uncertain if your area has been approved for hot work contact EHS for more information.  **☐ Other PPE, Specify**: |
|  | P14. |  |  |

**Section 3: Certify the Hazard Assessment**

Please certify that the hazard assessment for the laboratory has been completed by filling out and signing this page.

**CERTIFICATION OF THE LABORATORY HAZARD ASSESSMENT AND PPE SELECTION \*\***

|  |  |  |
| --- | --- | --- |
| Principal Investigator’s (PI) Name (Print Name): | Department/Unit: | |
| Building(s): | Room(s): | |
| Lab Supervisor’s Name: | Lab Supervisor’s Phone: | |
| Completed by (Print Name): | Signature: | Date |
| Signature of PI: | | Date |

**Section 4: PPE Training Documentation**

Laboratory safety training must be conducted by the Principal Investigator, Lab Supervisor, or their designee. Training will identify and discuss potentially hazardous tasks performed in the lab as well as selection and use of lab specific PPE to protect the laboratory worker or researcher. The training content, instructor, and student attendees must be documented. To provide adequate training, the PI, Lab Supervisor or their designee will provide the following:

1. Identify all applicable safety training topics needed for lab personnel and assure that these trainings are completed.
2. The PI, lab Supervisor, or their designee will review the completed Lab PPE Hazard Assessment Guide with lab personnel. It describes the operations in the lab where personnel need PPE for protection against exposure to hazards. In this step, the hazard assessment is used as a training tool. While discussing lab operations and the associated hazards with lab personnel, the Supervisor will address the following:
   * How the lab obtains PPE
   * What types of PPE are used in the lab and for which tasks
   * Where and how the PPE is stored and maintained
   * How to inspect and what to look for to confirm PPE is in good condition before putting it on. If not, replace the PPE.
   * How to put on, wear, adjust for proper fit, and remove PPE
   * How to properly use the PPE
   * How to properly decontaminate and clean reusable PPE, and how to properly dispose of single-use PPE
   * Discuss any limitations of the PPE
   * General PPE safety practices, including not wearing PPE outside of lab hazard areas (e.g. hallways and eating areas).
3. Trained lab personnel will sign the training documentation to acknowledge that they have reviewed and been trained on the Laboratory PPE Assessment Guide.
4. Conduct refresher training whenever the hazard assessment and/or PPE selected for use is updated.

**Laboratory PPE Hazard Assessment Guide Training Acknowledgement:**

Principal Investigator: Department/Unit:

Building: Room:

Trainer: Trainer Job Title:

I have read, asked questions, and understand the PPE requirements for the activity/materials described for my work.

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| --- | --- | --- | --- | --- |
| **Date** | **Name of Person Trained** | **Title** | **W Number** | **Signature** |
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