



# Local Health Department Environmental & Public Health Personal Protective Equipment Program

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# Introduction

## OPHP Information

The mission of Oregon Public Health Division, Occupational Public Health Program (OPHP) is to:

- Work toward providing a safe and healthful living, learning, and working environment for every member of the greater public and environmental health community by assuring safe work practices through educating, training, and assisting Local Health Departments (LHDs) and individual public health workers;
- Help local health departments (LHDs) and individual public health workers achieve compliance with all health and safety state and federal regulations and occupational, environmental and public health policies as economically as possible; and
- Act as liaison with State of Oregon regulatory agencies and monitor compliance with mandatory health and safety standards where necessary.

## Purpose

Occupational Public Health Program (OPHP) developed this program to help LHDs, divisions and sections protect employees from exposure to workplace hazards and to facilitate compliance with state and federal safety-related regulatory requirements. This program complies with the requirements of the Oregon Occupational Safety and Health Administration (OR-OSHA) regulations, 29 CFR 1910 Subpart I and 29 CFR 1926 Subpart E., and satisfies a DHS Center for Disease Control and Prevention Emergency Preparedness Grant.

Personal Protective Equipment (PPE) protects employees from the risks of injury by creating a barrier against workplace hazards. PPE must be used when the eyes, face, hands, extremities, or other parts of the body are exposed to workplace hazards that cannot be controlled by other means. PPE is not a substitute for good *engineering controls*, *administrative controls*, or safe work practices, but should be used in conjunction with those controls to ensure the safety and health of employees. The use of PPE does not eliminate the hazard, and if the PPE fails or is used improperly, worker exposure to the hazard may occur. Employees must be trained on the limitations of PPE, and on its proper selection, fit, use and care. Employees must also be aware that PPE does not eliminate the hazard. If the equipment fails or is used improperly, they will be exposed to the hazard and may suffer injury or illness.

*Engineering Controls* reduce or prevent employee exposure to a hazard on a relatively permanent basis, and are the most desirable type of hazard control. Examples of engineering controls include installing barricades and shields, product substitution, or improving the work area layout, tools, lighting, or ventilation. *Administrative Controls* involve changing the methods, schedule or procedures used to perform specific tasks to reduce employee exposure to a hazard.

## Application

The Personal Protective Equipment Program will be implemented by:

- Designating responsible persons by LHDs, divisions or sections to coordinate the requirements of this program at their worksites;
- Training by OPHP, or the LHD manager, designated LHD personnel, or EP Regional Liaisons;
- Performing a hazard assessment of worksites and/or employee job duties by designated personnel;
- Assigning PPE to employees based upon the results of the hazard assessment performed;
- Training of employees by designated personnel; and,
- Evaluating the effectiveness of the PPE Program on a periodic basis, modifying training or the written program as needed to address identified deficiencies.

## Scope

This program applies to all Local Health Departments that have not developed and implemented an “all hazard” PPE program for all work performed at or from the LHDs, and to all work performed by LHD employees regardless of jobsite location (as required by OR-OSHA regulations 29 CFR 1910 Subpart I and 29 CFR 1926 Subpart E). Local Health Department administrators may elect to call on Oregon OSHA Consultative Services (at 1-800-922-2689). OR-OSHA Consultative services are free and upon management’s request can facilitate the PPE program implementation process. OR-OSHA Consultative Services provide health, safety and ergonomics professionals to assist employers develop required occupational safety and health programs.

This program specifically addresses eye, face, foot, hand, and torso protection. Public, Local and Environmental Health departmental personnel that are designated and expected to respond to a significant incident defined by the National Incident Management System (NIMS) under the National Response Framework (NRF) by the State Public Health Agency Operations Center (AOC) or their County Emergency Operations Center (EOC) are covered under the scope of this PPE program. This program does not directly address PPE required for respiratory, noise, non-ionizing radiation (such as laser or electromagnetic frequency) hazards, ionizing radiation, fall or electrical hazards, though the need for such PPE may be identified during the hazard assessment process. If such potential hazards are identified during the assessment process, contact the Public & Environmental Health Industrial Hygienist in Toxicology and Occupational Consultative Services at 971-673-0977, or OR-OSHA Consultative Services (1-800-922-2689).

Supplemental information on PPE required for public and environmental health laboratory operations and AOC operations may be found in the Public and Environmental Health Chemical & Biological Hygiene Plan (CHBP). A copy of the CHBP may be obtained by contacting the Laboratory Safety Chemical and/or Biological Manager. Specific ionizing radiation laboratory operations are addressed in a separate Radiation Laboratory Safety and Health Plan and available through the Radiation Protection Services Manager.

# Responsibilities

## OPHP

The Personal Protective Equipment Program will be implemented by using “Train-The-Trainer” methods. OPHP will provide technical support, supervisory-level training, and oversight for the program. OPHP will, upon request or as practical, provide training for non-supervisory personnel. OPHP involvement does not relieve public, local & environmental health departments, supervisors, or contractors of their individual responsibilities. OPHP is responsible for assisting LHDs to develop, implement, and administer this PPE Program, as described below:

- Training LHD representative(s) to conduct workplace hazard assessments.
- Assisting with the hazard assessment surveys by serving as a technical resource.
- Providing guidance on the selection, care, and use of PPE.
- Providing training and technical assistance to the designated departmental personnel.
- Developing and maintaining the PPE train-the-trainer manual, videos, and other training resources.
- Consulting on the Environmental & Public Health Respiratory Protection and Hearing Conservation programs, and evaluating workplace exposure to hazards that would require the use of respirators or hearing protection.
- Consulting on the Chemical & Biological Hygiene Plan, covering the use of protective devices in laboratory operations.

## Local Health Department Responsibilities

LHDs are expected to maintain safe and healthy living, learning, and working environments for Health-care workers, staff, Environmental Health Specialists, student - interns, and visitors to LHD facilities. Departments should require workers, student - interns, and visitors to use, where necessary, personal protective equipment and protective work clothing suitable to protect them from contact with, or exposure to, hazardous conditions or substances within departmental facilities and when at work away from departmental facilities.

It is recommended that each department, division or section designate one person to coordinate and implement this program (e.g., the PPE Coordinator(s)), though any equally effective method may be used if compliance with the requirements of this program is assured. This individual should:

- Conduct or coordinate inspections of all workplaces to determine the need for PPE and help in selecting the proper PPE for each task performed.
- Maintain centralized records of hazard assessments, training, and inspections.
- Evaluate the overall effectiveness of the PPE Program on a periodic basis, revising the program as needed to assure the safety of LHD employees.

This responsibility will fall to the highest supervisory level of each departmental unit unless otherwise specified. The name(s) of designated personnel must be provided to OPHP. OPHP will assist the PPE coordinator with completion of job task hazard assessments. This PPE Coordinator, or other person(s) designated by the department, will perform the following operations once they are trained by OPHP:

- **Job Task Hazard Assessments.** Each department, division or section is required by OR-OSHA to assess the hazards in their workplace(s) to determine which operations require personal protective equipment. In some situations it may be more appropriate for the hazard assessment to involve a review of an employee’s job duties or duties for a class of employee to determine if work is performed that will require the use of PPE. This hazard assessment must be performed in accordance with the requirements outlined in this program. Seek assistance from OPHP as needed to evaluate

hazards. Reassess the worksite when new hazards are introduced or when processes are changed or added in the work place.

- **Equipment selection.** If the work site hazard assessment or the review of employee job duties indicate that there is exposure to a hazard(s) that requires the use of PPE, the designee(s) should:
  - ❑ Select, and have each affected employee use, the type(s) of PPE that will protect the employee from the hazards identified in the hazard assessment.
  - ❑ Inform the employee of the reasons for selecting the specific PPE.
  - ❑ Select PPE that properly fits each affected employee.
  - ❑ Verify that the hazard assessment has been performed through a written certification. This certification must identify the workplace or job duties evaluated, the name of the person performing the assessment, and the date of the assessment.
- **Employee-owned equipment.** Where employees provide their own protective equipment, the LHD is responsible for assuring that it is adequate for the hazardous condition, and that this equipment is properly maintained as required by this program.
- **Design.** The LHD must assure that all PPE is of a safe design and construction for the work to be performed.
- **Defective and damaged equipment.** The department must assure that defective or damaged personal protective equipment is not used.
- **Training.** The person(s) designated above, or other assigned LHD representative, must train each employee who is required to use PPE.
- **Recordkeeping.** Maintain records of hazard assessments, PPE assignments and training, and provide a copy of all records to OPHP.

## Employees

Employees required to use PPE are responsible for following the requirements of this program. Employees are expected to:

- ✓ Attend required training sessions on PPE.
- ✓ Wear PPE as required.
- ✓ Clean, maintain, and care for PPE as required.
- ✓ Inform the departmental PPE Coordinator of the need to repair or replace PPE.

## Contractors

Contractors must comply with all local, state, and federal safety requirements, and must ensure that all of their employees performing work on LHD property have been suitably trained.

## Visitors

Visitors to LHD property must abide by the requirements of this program. It is the responsibility of the person(s) hosting the visitors to enforce this program. PPE used by visitors, whether provided by the visitor or the host department, must meet the minimum requirements established for public, local and environmental health employees.

# Training

All employees required to wear PPE must receive training in the proper use and care of their PPE. It is expected that either the supervisor or other person(s) designated by the LHD will provide this training. This training must include the following:

- ✓ Why PPE is needed.
- ✓ When PPE is to be worn.
- ✓ What PPE is necessary.
- ✓ How to properly don, doff, adjust, and wear PPE.
- ✓ The limitations of PPE.
- ✓ The proper care, maintenance, useful life, and disposal of PPE.
- ✓ The employee must demonstrate an understanding of the training and ability to use PPE properly before being allowed to perform work requiring the use of PPE.

The designee - PPE Coordinator(s) - must maintain a written certification that each affected employee has received and understood the required training. This certification must include the name of each employee trained, the dates(s) of training, and the subject of the training. A blank training certificate may be found at the end of Appendix H.

When the PPE Coordinator(s) or OPHP has reason to believe that an employee using PPE does not have the understanding and skill required to use this equipment safely, the employee must be retrained immediately. Retraining is also required when changes in the workplace render previous training obsolete, or when changes in the type of PPE to be used render previous training obsolete. The PPE Coordinator for the LHD will be provided training and training media by OPHP.

# Hazard Assessment and Equipment Selection

## Evaluation of Hazards

Two types of hazard assessments may need to be performed by the local or public health agency. *Workplace hazards* should be evaluated when an employee works at one location or performs only one class of work. *Job task hazards* should be evaluated when an employee does not work at a fixed location and is exposed to hazards at a number of work locations or conditions.

### Workplace Hazards

The PPE Coordinator(s) will be reviewing departmental workplaces to determine if hazards are present or are likely to be present that require the use of PPE. The workplace hazard assessment is conducted using the guidance provided in Appendix A and must be documented in writing using the form provided in Appendix H. A copy of this assessment must be provided to OPHP.

The first step of the hazard assessment is to perform a walk-through survey of the worksite to observe and record potential or actual hazards. Hazards are identified as follows:

- Electrical hazard
- Presence of sharp objects or edges
- Stacked or stored objects that could fall or roll
- Sources of ionizing radiation
- Sources of light radiation
- Sources of electromagnetic radiation
- Types of chemical exposure
- Sources of biohazards, healthcare-associated infections
- Layout of workplace
- Sources of rolling or pinching objects
- Sources of high and low temperature
- Exposed moving parts of machinery or equipment
- Sources of dust, vapor, fumes

After the worksite survey is completed, hazards are grouped into the following categories:

- Impact
- Amputation
- Caught
- Crushed
- Heat (convection, contact)
- Penetration
- Compression (roll-over)
- Chemical (hazardous, liquid, solid)
- Biological exposure
- Radiological (ionizing & non-ionizing)
- Respiratory exposure
- Light (optical) radiation exposure
- Temperature extremes, body fatigue
- Electrocutation, shock
- Hearing exposure
- Harmful gas, vapor, dust, mist or fume

Finally, organize your data by hazard, and assess the hazards as to the type, level of risk, and seriousness of potential injury or illness. This evaluation should include the possibility of exposure to multiple hazards.

### Job Task Specific Hazards

When an employee is exposed to hazards on multiple job sites or conducts several different types of job tasks in a shift the employee and/or the employee's supervisor should be interviewed to identify the hazards to which he or she is exposed. The job task hazard assessment is conducted using the guidance provided in Appendix A. The assessment must be documented in writing using the form provided in Ap-

pendix H and a copy of this assessment must be provided to OPHHP. The hazard assessment is performed in a manner similar to the evaluation of workplace hazards.

### **PPE Selection**

Appropriate PPE is selected based upon the hazard(s) identified and using the guidance in:

- Appendix A: Hazard Assessment and Personal Protective Equipment Selection
- Appendix B: Eye and Face Protection
- Appendix C: Head Protection
- Appendix D: Foot Protection
- Appendix E: Hand Protection
- Appendix F: Protective Clothing and Body Protection
- Appendix G: Fall Protection, Hearing Protection, Respiratory Protection, and Electrical Protective Devices
- Appendix H: Miscellaneous Forms
- Appendix I: Who Pays for PPE?

## References

### **Published Sources**

Referenced standards are detailed in the Appendices. A copy of these standards may be obtained by contacting OPHP directly.

### **People to Contact**

If you have questions related to this program or need technical assistance, please Contact OPHP at 971-673-0977, or OR-OSHA Consultative Services (1-800-922-2689).

### **On-line Information**

- Reserved -

# Regulations

## **Federal Occupational Safety and Health Administration (OSHA) and Oregon OSHA General Industry Standards:**

- 29 Code of Federal Regulations (CFR) 1910.95 Occupational Noise Exposure; *Division 2/G: 1910.95.*
- 29 CFR 1910.97 Non-ionizing radiation; *Division 2/G: 1910.97*
- 29 CFR 1910.132 General PPE; *Division 2/I: 1910.132 – 437-002-*
- 29 CFR 1910.133 Eye and Face Protection; *Division 2/I: 1910.133*
- 29 CFR 1910.134 Respiratory Protection; *Division 2/I: 1910.134*
- 29 CFR 1910.135 Head Protection; *Division 2/I: 1910.135*
- 29 CFR 1910.136 Foot Protection; *Division 2/I: 1910.136*
- 29 CFR 1910.137 Electrical Protective Equipment; *Division 2/I: 1910.137*
- 29 CFR 1910.138 Hand Protection; *Division 2/I: 1910.138*
- 29 CFR 1910.1096 Ionizing Radiation; *Division 2/Z: 1910.1096*
- 29 CFR 1910.120 HAZWOPER; *Division 2/H: 1910.120*
- 29 CFR 1910.1030 Bloodborne Pathogens; *Division 2/Z: 1910.1030*

## **Occupational Safety and Health Administration, Construction Industry Standards:**

- 29 CFR 1926.52 Occupational Noise Exposure
- 29 CFR 1926.53 Ionizing Radiation
- 29 CFR 1926.54 Non-ionizing Radiation
- 29 CFR 1926.95 - Criteria for personal protective equipment.
- 29 CFR 1926.96 - Occupational foot protection.
- 29 CFR 1926.100 - Head protection
- 29 CFR 1926.101 - Hearing protection
- 29 CFR 1926.102 - Eye and face protection
- 29 CFR 1926.103 - Respiratory protection
- 29 CFR 1926.104 - Safety belts, lifelines, and lanyards

# Definitions

**Administrative Controls** involve changing the methods or procedures used to perform specific tasks to reduce employee exposure to a hazard. An example of an administrative control would be employee rotation to reduce the time that an employee is exposed to a hazard.

**Engineering Controls** reduce or eliminate employee exposure to a hazard on a relatively permanent basis, and are the most desirable type of hazard control. Examples of engineering controls include installing barricades and shields, or changing the work area layout, tools, lighting, or ventilation.

**Metatarsal:** The middle part of the foot that forms the instep.

**Material Safety Data Sheet (MSDS)** is a summary sheet provided by the manufacturer of a chemical or other potentially hazardous product. The MSDS explains the hazards of the material and the precautions that must be taken to prevent fires, explosions or harmful health effects.

**Qualified Person** is one who has received training appropriate for the tasks to be performed and has demonstrated the necessary skills and techniques to perform his or her work safely.

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# Appendix A: Hazard Assessment and Personal Protective Equipment Selection

- Assess hazards
- Group the hazards
- Assess risk
- Select PPE
- PPE training
- Record keeping

## Personal Protective Equipment Selection

### Overview of the Hazard Assessment Process

#### Hazard Identification

The first step of the hazard assessment is to inspect the worksite and/or review the type of work and task(s) performed by an employee if he or she conducts work at multiple sites. The purpose of the inspection and/or job review is to identify the hazards to which the employee is exposed. Your inspection findings should be documented on the Hazard Assessment Form found in this Appendix. During this inspection/review pay particular attention to the following potential hazards:

- Moving equipment, parts of equipment, processes or personnel that could result in collision, compression or impact (including use of vehicles).
- Potential for objects to fall or drop from above an employee.
- Exposure to biologicals and chemicals of vapor, dust, mist or fumes.
- Rolling or pinching objects or machinery processes that could crush body parts, catch hair or snag loose clothing.
- Electrical hazards, either from equipment, wiring, or utilities.
- Presence or use of sharp objects that could cut or pierce the body.
- Hot or cold surfaces that could cause burns or freezing.
- Light (optical) radiation from welding, cutting, brazing or other sources.
- Use of tools or equipment that may generate flying debris, dusts or noise.
- Potential for infectious disease exposure.
- The layout of the workplace and the locations of coworkers and the way that work is staged or performed.

#### Organize Your Data

After you have completed your walk-through survey and/or employee interview, organize the data using the hazard assessment form found at the end of this Appendix.

#### Analyze Your Data

Determine the level of risk and the seriousness and type of potential injury from each of the hazards identified during your assessment. The possibility of exposure to several hazards simultaneously should also be considered.

#### Control or Eliminate the Hazard(s)

Before you select and provide PPE to an employee, first determine if exposure to the hazard can be reduced or eliminated through the use of administrative or engineering controls. Ask the following questions:

- Does the manufacturer supply guards for the machinery or equipment?
- Do these guards completely contain or control exposure to the hazard if used properly?

- Can a shield, barrier, or guard be manufactured or purchased that will contain or control exposure to the hazard?
- Can older equipment be replaced with newer, safer equipment?
- Can the layout of the worksite be changed to eliminate or reduce exposure to the hazard?
- Can the product or chemical used be replaced with a less hazardous product or chemical?
- Can exposure to an airborne dust/fume or chemical/biological hazard be controlled with exhaust ventilation?

If the answer to any of the above is 'yes', or 'maybe', it may be possible to use administrative or engineering controls to eliminate or reduce the hazard. Contact OPHP for assistance or guidance at 971-673-0977, or OR-OSHA Consultative Services (1-800-922-2689).

### **Select PPE Appropriate for the Hazard(s)**

Your review of the potential hazards in relation to specific job activities is the basis for selecting PPE. The quick reference charts contained in each Appendix are a good place to begin. After identifying the basic hazards, the general procedure for selection of protective equipment is to:

- Review the types of protective equipment that are available. An overview of the various types of PPE is provided in Appendices B through H.
- Compare the specifics of the hazard (i.e., how heavy and/or fast the object is moving, projectile shape, the type of light being emitted, duration of exposure, etc.) against the capabilities of the available protective equipment.
- Select protective equipment that provides a level of protection adequate to protect the employee from the hazard.

The PPE must be fit to the user, and the employee must be given instructions on the care and use of his or her PPE. It is very important that end users are made aware of all warning labels, limitations and are involved in fitting of their PPE.

### **Fitting the Device**

Give careful consideration to the comfort and fit of PPE. PPE that fits poorly will not provide the necessary protection, and an employee is less likely to wear the device if it does not fit comfortably. Protective devices are generally available in a variety of sizes. Care should be taken to ensure the right size is selected for each individual wearer.

Particular care should be taken in fitting devices for eye protection against dust and hazardous chemical splash to ensure that the devices are sealed to the face. In addition, proper fitting of helmets is important to ensure that they will not fall off during work operations. In some cases a chinstrap may be necessary to keep the helmet on an employee's head. (Chinstraps, if provided, should break at a reasonably low force so as to avoid a strangulation hazard). Always review and follow the manufacturer's instruction.

### **Devices with adjustable features**

Adjustments must be made on an individual basis for a comfortable fit that will maintain the protective device in the proper position.

### **Reassessment**

It is the responsibility of the departmental representative to reassess workplace hazards when new equipment, processes, or other hazards are introduced.

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<b>I am reviewing (check the appropriate box at right):</b>	<input type="checkbox"/> A worksite	Specify location:
		Name of employee:
	<input type="checkbox"/> Employee's job description	Working title of position:
		Position Number:
	<input type="checkbox"/> Job description for a class of employees	Working title of positions:
		Position Number(s):
<b>Date:</b>	<b>Your name:</b>	<b>DEPARTMENT:</b>

**EYE HAZARDS (Appendix B).** Tasks that can cause eye injury include: working with chemicals or acids; chipping, sanding, or grinding; welding; furnace operations; metal and wood working. Illness may result from absorption/infection.

Check appropriate box for each hazard:	Description of hazard(s): location, duration, frequency, severity.	Control or PPE required:
Chemical Exposure      Yes <input type="checkbox"/> No <input type="checkbox"/>		
High Heat/Cold          Yes <input type="checkbox"/> No <input type="checkbox"/>		
Dust or Flying Debris    Yes <input type="checkbox"/> No <input type="checkbox"/>		
Impact                      Yes <input type="checkbox"/> No <input type="checkbox"/>		
Light/Radiation          Yes <input type="checkbox"/> No <input type="checkbox"/>		
Biological Exposure      Yes <input type="checkbox"/> No <input type="checkbox"/>		

**HEAD HAZARDS (Appendix C).** Tasks that can cause head injury include: working below other workers who are using tools or materials that could fall; working on energized electrical equipment or utilities; and, working in trenches or confined spaces.

Check appropriate box for each hazard:	Description of hazard(s): location, duration, frequency, severity.	Control or PPE required:
Impact                      Yes <input type="checkbox"/> No <input type="checkbox"/>		
Electrical Shock          Yes <input type="checkbox"/> No <input type="checkbox"/>		
Chemical                    Yes <input type="checkbox"/> No <input type="checkbox"/>		
Biological                  Yes <input type="checkbox"/> No <input type="checkbox"/>		
Light/Radiation          Yes <input type="checkbox"/> No <input type="checkbox"/>		

**FOOT HAZARDS (Appendix D).** Tasks that can cause foot injury include: exposure to chemicals or acids; welding or cutting; foundry operations; materials handling; renovation or construction; electrical work; and, spray finishing or other work with flammable or explosive materials.

Check appropriate box for each hazard:	Description of hazard(s): location, duration, frequency, severity.	Control or PPE required:
Chemical Exposure      Yes <input type="checkbox"/> No <input type="checkbox"/>		
High Heat/Cold          Yes <input type="checkbox"/> No <input type="checkbox"/>		
Impact / Compression    Yes <input type="checkbox"/> No <input type="checkbox"/>		
Puncture                    Yes <input type="checkbox"/> No <input type="checkbox"/>		
Explosive/Flammable Atmospheres      Yes <input type="checkbox"/> No <input type="checkbox"/>		
Slippery/Wet Surfaces    Yes <input type="checkbox"/> No <input type="checkbox"/>		
Electrical                  Yes <input type="checkbox"/> No <input type="checkbox"/>		
Cuts or Abrasion          Yes <input type="checkbox"/> No <input type="checkbox"/>		
Biological Exposure      Yes <input type="checkbox"/> No <input type="checkbox"/>		

**HAND/SKIN HAZARDS (Appendix E).** Hand injury can be caused by: work with chemicals or acids; exposure to cut or abrasion hazards (for example, during demolition, renovation, or woodworking); and work with very hot or cold objects or materials. Illness may result from hand/skin absorption/infection.

<b>Check appropriate box for each hazard:</b>	<b>Description of hazard(s): location, duration, frequency, severity.</b>	<b>Control or PPE required:</b>
Chemical Exposure      Yes <input type="checkbox"/> No <input type="checkbox"/>		
High Heat/Cold          Yes <input type="checkbox"/> No <input type="checkbox"/>		
Impact / Compression    Yes <input type="checkbox"/> No <input type="checkbox"/>		
Puncture                  Yes <input type="checkbox"/> No <input type="checkbox"/>		
Biological contact        Yes <input type="checkbox"/> No <input type="checkbox"/>		
Slippery/Wet Surfaces    Yes <input type="checkbox"/> No <input type="checkbox"/>		
Electrical                  Yes <input type="checkbox"/> No <input type="checkbox"/>		
Cuts or Abrasion          Yes <input type="checkbox"/> No <input type="checkbox"/>		

**BODY/TORSO HAZARDS (Appendix F).** Injury of the body or torso occurs during: exposure to chemicals, acids, or other hazardous materials; abrasive blasting; welding, cutting, brazing; chipping, sanding, or grinding; use of chainsaws or similar equipment; foundry operations; and, work around electrical arcs. Illness may result from absorption/infection.

<b>Check appropriate box for each hazard:</b>	<b>Description of hazard(s): location, duration, frequency, severity.</b>	<b>Control or PPE required:</b>
Chemical Exposure      Yes <input type="checkbox"/> No <input type="checkbox"/>		
Biological Exposure      Yes <input type="checkbox"/> No <input type="checkbox"/>		
High Heat/Cold          Yes <input type="checkbox"/> No <input type="checkbox"/>		
Impact / Compression    Yes <input type="checkbox"/> No <input type="checkbox"/>		
Puncture                  Yes <input type="checkbox"/> No <input type="checkbox"/>		
Explosive/Flammable Atmospheres      Yes <input type="checkbox"/> No <input type="checkbox"/>		
Slippery/Wet Surfaces    Yes <input type="checkbox"/> No <input type="checkbox"/>		
Electrical                  Yes <input type="checkbox"/> No <input type="checkbox"/>		
Cuts or Abrasion          Yes <input type="checkbox"/> No <input type="checkbox"/>		

**NOISE HAZARDS (Appendix G).** Personnel may be exposed to noise hazards when machining, grinding, sanding, using pneumatic equipment, generators, motors, jackhammers, sirens or similar equipment.

<b>Check appropriate box for each hazard:</b>	<b>Description of hazard(s): location, duration, frequency, severity.</b>	<b>Control or PPE required:</b>
Noise Exposure      Yes <input type="checkbox"/> No <input type="checkbox"/>		
Type:		

**FALL HAZARDS (Appendix G).** Personnel may be exposed to fall hazards when performing work on a surface with an unprotected side or edge that is 6 feet or more above a lower level, or 10 feet or more on scaffolds. Fall protection may also be required when using vehicle manlifts, elevated platforms, tree trimming, performing work on poles, roofs, or fixed ladders.

Check appropriate box for each hazard:	Description of hazard(s): location, duration, frequency, severity.	Control or PPE required:
Fall > 10 ft		
Fall < 10 ft		
Uneven surface		

**RESPIRATORY HAZARDS (Appendix G).** Personnel may be exposed to respiratory hazards that require the use of respirators: when using certain chemicals or exposed to biological agents outside of fume hood or a biological safety cabinet; when applying paints or chemicals in confined spaces; when exposed to welding, cutting, or brazing on certain metals; and, when exposed to asbestos, lead, silica, or other particulate hazards.

Check appropriate box for each hazard:	Description of hazard(s): location, duration, frequency, severity.	Control or PPE required:
Vapor/gas Exposure      Yes <input type="checkbox"/> No <input type="checkbox"/>		
Confined space work      Yes <input type="checkbox"/> No <input type="checkbox"/>		
Particulate exposure      Yes <input type="checkbox"/> No <input type="checkbox"/>		
Radiation exposure      Yes <input type="checkbox"/> No <input type="checkbox"/>		
Biological exposure      Yes <input type="checkbox"/> No <input type="checkbox"/>		

**Explosive Atmosphere** Personnel may be exposed to a release of a flammable substance of such force or quantity to cause an explosive atmosphere. Upon indication of exposure to a flammable gas or solvent that could result in an explosion leave the area immediately in a manner not to cause an ignition source. When at a safe distance, immediately call 911 and report incident to management. **DO NOT ATTEMPT TO STOP THE RELEASE.** An explosive atmosphere is not a normal operational condition and is considered Immediately Dangerous to Life or Health.

I certify that the above inspection was performed to the best of my knowledge and ability, based on the hazards present on this date

(signature) \_\_\_\_\_.

# Appendix B: Eye and Face Protection

## Compliance with National Standards

All personal protective clothing and equipment must be of safe design and construction for the work to be performed and must be maintained in a sanitary and reliable condition. Eye and face protection used by employees must meet NIOSH or ANSI (American National Standards Institute) standards as follows:

- ✓ Protective eye and face devices purchased after July 5, 1994 must comply with ANSI Z87.1-1989, "American National Standard Practice of Occupational and Educational Eye and Face Protection".
- ✓ Eye and face protective device purchased before July 5, 1994 must comply with the ANSI Z87.1-1968 "USA Standard for Occupational and Educational Eye and Face Protection."

CDC specifies the use of eye protection suitable to prevent exposure to infectious agents during high risk medical procedures or at anytime there may be infectious spray or airborne exposure.

The referenced standards do not apply to hazards related to X-rays, gamma rays, high-energy particulate radiation, microwaves, or radio-frequency radiation. Information on PPE required for work involving these hazards is available through:

- ✓ Radiation Protective Services & OPHP for ionizing radiation; and,
- ✓ OPHP for non-ionizing radiation.

## General Requirements

Employees must use appropriate eye or face protection when exposed to eye or face hazards from flying particles, molten metal, acids or caustic liquids, other liquid chemicals hazardous to the eye, chemical gases or vapors, or potentially hazardous light radiation. Each affected employee must use eye protection that provides side protection when there is a hazard from flying objects. Detachable side protectors (e.g. clip-on or slide-on shields) are acceptable if they meet the ANSI requirements. Eye and face PPE must be marked to identify the manufacturer.

Face shields must be used in combination with goggles when there is a potentially significant chemical splash hazard. Face shields must be worn over primary eye protection (safety glasses or goggles) when there is a potentially severe exposure to flying fragments or objects, hot sparks from furnace operations, potential splash from molten metal, or extreme temperatures.

The Selection Chart for Eye and Face Protection located at the end of this appendix provides guidance on how to select appropriate PPE for the hazards that you identify during the hazard assessment process.

Each affected employee who wears prescription lenses, while engaged in operations that involve eye hazards, must either:

- ✓ Wear eye protection that incorporates the prescription in its design, or,
- ✓ Wear eye protection that can be worn over the prescription lenses without disturbing the proper position of the prescription lenses or the protective lenses.

Each affected employee must use equipment with filter lenses that have a shade number appropriate for the work being performed for protection from injurious light radiation. Tinted and shaded lenses are not filter lenses unless they are marked or identified as such.

## **Types of Eye and Face Protection**

### **Safety Glasses**

Protective eyeglasses are made with safety frames, tempered glass or plastic lenses, temples and side shields which provide eye protection from moderate impact and particles encountered in job tasks such as carpentry, woodworking, grinding, scaling, etc. Prescription safety glasses and tinted lenses are also available. Standard safety glasses are designed to protect against flying particles. Safety glasses have lenses that are impact resistant and frames that are far stronger than regular eyeglasses.

### **Safety Goggles**

Vinyl framed goggles of soft pliable body design provide adequate eye protection from many hazards. These goggles are available with clear or tinted lenses, perforated, port vented, or non-vented frames. Single lens goggles provide similar protection to spectacles and may be worn in combination with spectacles or corrective lenses to ensure protection along with proper vision.

Like safety glasses, goggles are impact resistant and are available with tinted lenses. Goggles offer the best all-around impact protection of all eyewear types because they form a positive seal around the eye area.

Appropriate shade numbers may need to be determined when working around various source of optical light non-ionizing radiation, such as lasers, welding, or metal cutting operations. Shade number, not shade color, should be used to determine appropriate light filter for the type of optical light energy that is being viewed. If there is need for such eye filter protection, then to help guide you with proper selection contact OPHP at 971-673-0977, or OR-OSHA Consultative Services (1-800-922-2689).

### **Face Shields**

Face shields normally consist of an adjustable head gear and face shield of either tinted or transparent acetate or polycarbonate materials, or wire screen. Face shields are available in various sizes, tensile strength, impact/heat resistance and light ray filtering capacity. Face shields are used in operations when the entire face needs protection and to protect the eyes and face against flying particles, metal sparks, and chemical or biological splash hazards.

### **Storage and Care**

Safety glasses and other eye and face protection should be stored carefully so they won't be scratched or damaged. In general, do not store this equipment where it would be exposed to high heat or sunlight.

- Inspect eye and face protection prior to use. If the equipment is damaged or broken do not use it because it may not be able to fully resist impact.
- Pitted lenses, like dirty lenses, make it more difficult for an employee to see and should be replaced. Lenses that are pitted or deeply scratched are more prone to break under impact and should be replaced.
- Clean eye and face protection according to the manufacturer's instructions. If the manufacturer's instructions are not available, clean with a mild soap and water solution by soaking in the soap solution (maintained at 120°F) for ten minutes. Rinse thoroughly and allow to air dry.
- PPE that has been previously used should be disinfected before being issued to another employee. PPE may be disinfected by completely immersing all parts in a solution of germicidal fungicide for 10 minutes. Remove the parts from the solution and allow to air dry at room temperature.

### **Related Requirements**

Employees working with corrosive chemicals hazardous to the eye must have immediate access to eye-wash and quick drench facilities. (OR-OSHA 437-002-(5))

## Selection Chart for Eye and Face Protection

The following chart provides general guidance for the proper selection of eye and face protection for hazards associated with the listed hazard “source” operations.

SOURCE	TYPE OF HAZARD	PROTECTION
<b>IMPACT</b> -Chipping, grinding, machining, masonry work, woodworking, sawing, drilling chiseling, powered fastening, riveting, and sanding.	Flying fragments, objects, large chips, particles, sand, dirt, etc.	Spectacles with side protection, goggles, and face shields. For severe exposure use face shield over primary eye protection.
<b>HEAT</b> -Furnace operations pouring, casting, hot dipping, welding, cutting and brazing.	Hot sparks	Face shields, goggle, and spectacles with side protection. For severe exposure use face shield. See Notes 1, 2, 3, 6, 7.
	Splash from molten metals	Face shields worn over goggles. See Note 1, 2, 3, 6, 7.
	High temperature exposure	Screen face shields, reflective face shields. See note: 1, 2, 3, 6, 7.
<b>CHEMICALS</b> - Acid and chemical handling, degreasing, plating	Splash	Goggle, eyecup and cover types. For severe exposure, use face shield. See notes 3, 6, 11.
<b>DUST</b> - Woodworking, buffing, general dusty conditions	Irritating mists	Special-purpose goggles
	Nuisance dust	Goggle, eyecup and cover types. See note 8
<b>LIGHT RADIATION</b> Welding and/or Electric arc	Optical radiation	Welding helmets or welding shields. Typical shades (Contact OPHP for technical assistance): See notes: 9, 12
<b>BIOLOGICAL</b>	Infectious material; Splash, spray or by contact	Safety glasses w/side shields; face shield; goggles that fit over prescription glasses
<b>GLARE</b>	Poor vision	Spectacles or welding face shield. Typical shades see notes 3 and 9. Spectacles with shaded or special-purpose lenses, as suitable. See notes 9, 10.

Notes to the Selection Chart for Eye and Face Protection may be found on the following page

### Notes to Eye and Face Protection Selection Chart

- Care should be taken to recognize the possibility of multiple and simultaneous exposures to a variety of hazards. Adequate protection against the highest level of each of the hazards should be provided. Protective devices do not provide unlimited protection.

2. Operations involving heat may also involve light radiation. When necessary, protection from other hazards must be provided.
3. Face shields should only be worn over primary eye protection (spectacles or goggles).
4. Filter lenses must meet the requirements for shade designations as outlined in the OSHA regulations and ANSI standards. Tinted and shaded lenses are not filter lenses.
5. Persons whose vision requires the use of prescription lenses must wear either protective devices fitted with prescription lenses or protective devices designed to be worn over regular prescription eyewear.
6. Wearers of contact lenses must also wear appropriate eye and face protection devices in a hazardous environment. It should be recognized that dusty and/or chemical environments might represent an additional hazard to contact lens wearers.
7. Caution should be exercised in the use of metal frame protective devices in electrical hazard areas.
8. Atmospheric conditions and the restricted ventilation of the protector can cause lenses to fog. Frequent cleansing may be necessary.
9. Welding helmets or faces shields should be used only over primary eye protection (spectacles or goggles).
10. Non-side shield spectacles are available for frontal protection only, but are not acceptable eye protection for the sources and operations listed for "impact."
11. Must provide adequate ventilation and also protect the wearer from splash entry. Eye and face protection should be designed and used so that it both ensures adequate ventilation and protects the wearer from splash entry.
12. Protection from light radiation is directly related to filter lens density. See note (4). Select the darkest shade that allows the task to be performed.

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## Appendix C: Head Protection

### Compliance with National Standards

All personal protective clothing and equipment must be of safe design and construction for the work to be performed and must be maintained in a sanitary and reliable condition.

Only those items of protective clothing and equipment that meet NIOSH or ANSI (American National Standards Institute) standards may be used.

Every hard hat conforming to the requirements of ANSI Z89.1-1986 must be appropriately marked to verify its compliance. The following information must be marked inside the hat: Manufacturer's name; legend, "ANSI Z89.1-1986"; and, the class designation (A, B, or C).

Protective helmets purchased before July 5, 1994 must comply with the ANSI standard "American National Standard Safety Requirement for Industrial Head Protection," ANSI Z89.1-1969. Protective helmets purchased after September 1997 must comply with ANSI Z89.1-1997, "American National Standard for Personnel Protection- Protective Headwear for Industrial Workers-Requirements."

### General Requirements

Each affected employee must wear protective helmets when working in areas where there is a potential for injury to the head from falling objects or impact. Some examples of occupations for which head protection should be routinely considered are: carpenters, electricians, linemen, mechanics and repairers, plumbers and pipe fitters, welders, laborers, freight handlers, timber cutting and logging, warehouse operations, construction, renovation operations and emergency response and recovery efforts in settings involving significant damage to trees and buildings.

Protective helmets designed to reduce electrical shock hazard must be worn by each affected employee when working near exposed electrical conductors which could contact the head. Employees working at higher elevations must wear protective helmets with chinstraps. The chinstrap should be designed to prevent the hard hat from being bumped off the employees' head, but must not be so strong that it presents a strangulation hazard.

### Types of Head Protection

The ANSI classification system for head protection changed significantly with the 1997 revision. This guide, therefore, provides a description of the classes and types of protective hats (helmets) referenced in both the 1986 and 1997 standards.

The 1986 standard requirements apply to helmets purchased prior to September 1997. A description of the type and class of helmets under the 1986 standard are shown in Table 2.

The 1997 standard requirements apply to helmets purchased after September 1997. A description of the type and class of helmets under the 1997 standard are shown in Table 3.

**Table 2****Description of Protective Helmets – 1986 Standard**

Type 1	Helmets with a full brim
Type 2	Brimless helmets with a peak extending forward from the crown.
Class A	General service, limited voltage. Intended for protection against impact hazard. Used in mining, construction, and manufacturing. Provide electrical protection from low-voltage conductors (proof tested to 2,200 volts).
Class <b>B</b>	Utility service, high voltage. Used by electrical workers and workers who also need protection from falling objects. Provides electrical protection from high-voltage conductors (proof tested to 20,000 volts).
Class C	Special service, no voltage protection. Designed for lightweight comfort and impact protection. Used in certain construction, manufacturing, refineries, and where there is a possibility of bumping the head against a fixed object. This class of helmet may not be used around electrical hazards.

**Table 3****Description of Protective Helmets – 1997 Standard**

Type 1	Helmets providing crown impact protection
Type 2	Helmets providing lateral impact protection
Class G	General service, limited voltage. Intended for protection against impact hazard. Used in mining, construction, and manufacturing. Provide electrical protection from low-voltage conductors (proof tested to 2,200 volts).
Class <b>E</b>	Utility service, high voltage. Used by electrical workers and workers who also need protection from falling objects. Provides electrical protection from high-voltage conductors (proof tested to 20,000 volts).
Class C	Conductive – no electrical protection. Designed for lightweight comfort and impact protection. Used in certain construction, manufacturing, refineries, and where there is a possibility of bumping the head against a fixed object. This class of helmet may not be used around electrical hazards.

Bump caps may be used when head (impact) protection isn't required, but where an employee may be exposed to minor head bumps or laceration hazards. Bump caps are not approved for use where impact protection is required.

### **Storage and Care**

If a helmet needs to be cleaned it should be scrubbed with a mild detergent and rinsed in clear water. After rinsing, the shell, straps and cradle should be carefully inspected for damage.

The shell, cradle, headbands, sweatbands, and accessories should be visually inspected daily for signs of cracks, dents, damage, or wear that might reduce the protection of the device. Any helmet with worn, damaged, or defective parts should be removed from service until the defective part has been replaced per the manufacturer's instructions. Tar, paint, oils, and some chemicals can damage the shell and reduce protection. Helmets should not be painted, and the manufacturer's instructions should be consulted if tars, paints, or similar materials need to be cleaned from the shell of the helmet.

Helmets must be worn properly and must be properly maintained to provide adequate protection. Do not:

- Drill holes for added ventilation.
- Paint or inscribe the helmet
- Allow the helmet to be exposed to extreme temperatures or direct sunlight for long periods of time. Don't, for example, store your helmet in the back window of your car.
- Wear the hard hat with the shell tilted to one side.
- Wear the hat backward (e.g., with the brim facing your back).
- Place stickers on the hard hat as these can hide signs of deterioration in the hard hat shell.

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# Appendix D: Foot Protection

## Compliance with National Standards

All personal protective clothing and equipment must be of safe design and construction for the work to be performed and must be maintained in a sanitary and reliable condition.

Only those items of protective clothing and equipment that meet NIOSH or ANSI (American National Standards Institute) standards may be used.

Protective footwear purchased after July 5, 1994 must comply with ANSI Z41.1- 1991, "American National Standard for Personal Protection-Protective Footwear". Protective footwear purchased before July 5, 1994 must comply with the ANSI Standard "USA Standard for Men's Safety-Toe Footwear," Z41.1-1967

## General Requirements

Each affected employee must wear protective footwear when working in areas where there is a danger of foot injury due to falling or rolling objects, chemical hazards, objects piercing the sole, or electrical hazards. Employees who cannot wear safety shoes for medical reasons must furnish a letter to their supervisor from their physician stating the reason and the anticipated duration of the condition. Employees must wear toe or foot guards over regular work shoes until a proper safety shoe is purchased or the condition subsides. The guards provided under these conditions must be furnished at no cost to the employee.

Protective guards, such as shoe-caps and metatarsal guards (to protect the middle part of the foot), are designed to slip over street shoes. Protective guards are not recommended if an employee will frequently encounter foot hazards on the job. They are not intended to replace steel-toed safety shoes or boots. There are no approved ANSI standards for protective guards.

All footwear requires routine inspection for cuts, holes, tears, cracks, worn soles, and other damage that could compromise its protective quality.

## Types of Protective Footwear

There are three basic types of protective footwear:

- **General protective footwear** that is worn in place of regular shoes or boots.
- **Overshoes**, which are worn over regular footwear.
- **Protective guards**, or safety devices that are worn over regular shoes or boots.

(**Metatarsal**: The middle part of the foot that forms the instep.)

The guidance provided in the Selection Chart for Foot and Leg Protection located at the end of this appendix will assist you in selecting PPE appropriate for the hazards that you identify during the hazard assessment process.

## General Protective Footwear

The five main types of general protective footwear are:

1. **Safety Toe Shoe or Boot**. These shoes are designed to protect feet from common hazards, such as falling or rolling objects, cuts, and punctures. The entire toe box and insole are reinforced with steel (or similar), and steel, aluminum, or plastic materials protect the instep. Safety shoes are also available that insulate against temperature extremes and/or are equipped with special soles to guard against slips, chemicals, and/or electrical hazards (see below). The shoe or boot may incor-

porate metatarsal protection, or a shield that protects the upper surface of the foot from impact or compression hazards. This type of footwear would generally be required for work around heavy pipes, activities involving manual material carts, or similar activities where heavy loads could drop on or roll over an employee's feet. Safety boots offer more protection when splash or spark hazards (chemicals, molten materials) are present. Chemical protective safety shoes and boots may be required to prevent or minimize chemical penetration when working with corrosives, caustics, cutting oils, or petroleum products. Safety shoes and boots may need to be used in conjunction with other PPE to provide greater protection against some work site hazards. For example, when exposed to molten metals or welding sparks, protect the lower legs and feet from heat hazards by using leather leggings or similar PPE. Safety snaps allow leggings to be removed quickly.

2. **Conductive footwear** – protects the wearer from static electricity by equalizing the differing electrical potentials.
  - Type 1 conductive footwear controls static electricity generated on the body of the worker, thereby preventing sparks which could ignite nearby flammable gases or liquids.
  - Type 2 conductive footwear is designed for linemen working with high-voltage lines where the electrical potential of the person and the energized equipment must be equalized.  
[NOTE: Conductive shoes are not general-purpose shoes and must be removed upon completion of the tasks for which they are required. Employees exposed to electrical hazards must never wear conductive shoes. Safety shoes and boots may need to be used in conjunction with other PPE to provide greater protection against some work site hazards. Conductive shoes are **not** general purpose shoes and must be removed upon completion of the tasks for which they are required. Non-conductive footwear must **not** be used in explosive or hazardous locations. NOTE: Employees must be instructed not to use foot powder or wear socks made of silk, wool, or nylon with conductive shoes. Consider consolidating these two notes. Also, if electrical linemen wear type 2 conductive footwear, we might need to clarify in the second sentence if the first not above that “Other than in those situations outlined above, employees exposed to electrical hazards must never wear conductive shoes”.
3. **Electrical hazard footwear** – shoes or boots designed with nonconductive materials (other than the steel toe, which is properly insulated to protect the wearer, or a toe made from another material). This type of footwear insulates the worker from energized parts. It is intended for secondary protection only, for use on surfaces that are already substantially insulated.  
NOTE: Non-conductive footwear must not be used in explosive or hazardous locations; in such locations, *electrically conductive* shoes are required.  
NOTE: Employees using electrical hazard footwear must be trained to recognize that the insulating protection of electrical hazard, safety-toe shoes may be compromised if:
  - The shoe is wet
  - The rubber sole is worn through
  - Metal particles become embedded in the sole or heel; or
  - Other parts of the employees' body come into contact with conductive grounded items.
4. **Sole puncture resistant footwear** - provide protection from nails, wire, tacks, screws, large staples, or similar objects that, if stepped on, could penetrate the sole of the shoe and result in foot injury.
5. **Static dissipative footwear** – insulates the wearer from electrical hazards that may exist in areas where static dissipative footwear is required.

## Overboots

Overboots protect a worker's boots and shoes from contact with contaminants, acids, solvents, or other chemicals, or a dirty or wet working environment. Overboots do not generally offer impact or compres-

sion protection, and may need to be worn in conjunction with safety shoes to provide adequate protection against workplace hazards. If chemical protection is required, assure the overboot is compatible with, and will provide adequate protection against, the expected exposure.

## **Protective Guards**

Protective guards consist of either shoe-caps or metatarsal guards. Protective guards can provide protection from foot injury, but should not be used to replace steel-toed safety footwear. Protective guards can be used where an employee is only occasionally exposed to foot hazards on the job.

## **Other Considerations**

Other types of special footwear that may be required for an employee to perform their job safely include: shoes with skid resistant soles, waterproof footwear, chemical-resistant footwear, and combinations thereof. Foundry or "Gaiter" style boots, for example, feature quick-release fasteners or elasticized insets to allow quick removal of the footwear if a hazardous substance or material (such molten metal) were to get into the boot itself.

*(Occasional - less than a few minutes per day, or hours per week)*

## **Storage and Care**

Inspect safety footwear prior to each use. Defective or damaged personal protective equipment must not be used. Remove the damaged equipment from service and report the condition to your supervisor. Follow the manufacturer's instructions for the care and maintenance of safety footwear.

## Selection Chart for Foot and Leg Protection

The following chart provides general guidance for the proper selection of foot and leg protection for hazards associated with the listed hazard “source” operations.

SOURCE	TYPICAL OCCUPATIONS REQUIRING PROTECTION	PROTECTION
<b>IMPACT</b> - Heavy tools, equipment, or objects that might roll or fall onto the feet of an employee.	Construction, demolition, or renovation operations; plumbing; building maintenance; trenching; utility work; grass cutting; materials handling.	Safety shoes or boots. Toe guards may be used over regular footwear only if an employee is infrequently exposed to this type of foot hazard.
<b>PUNCTURE</b> – Work where wire, tacks, staples, metal, or nails could be stepped on by employees causing a foot injury.	Construction, demolition, and renovation operations; building maintenance.	Safety shoes or boots with puncture protection.
<b>COMPRESSION</b> – Handling of unusually heavy objects or using heavy tools or equipment that present a compression hazard to the top of the foot.	Heavy materials handling, such as work activities involving skid trucks around heavy pipes; work using a jackhammer; pavement breaking.	Metatarsal footwear (protecting the mid-foot). Metatarsal guards may be used over regular footwear only if an employee is infrequently exposed to this Type of foot hazard. Shin guards may be required for some operations where the lower leg is exposed to a rolling impact hazard.
<b>HEAT</b> - Exposure to molten metal or other super-heated fluids.	Furnace operations; pouring, casting, hot dipping; welding, cutting and brazing.	Foundry or heat resistant shoes or boots as appropriate. Leggings should be used as appropriate to protect the lower legs from molten metal or welding sparks.
<b>CHEMICALS</b> -Splash hazard or direct contact/work with chemicals.	Acid and chemical handling, degreasing, plating, chemical spill response.	Consult the manufacturers’ literature for a chemical resistant boot appropriate for the chemical hazard. Footwear may need to incorporate a safety toe if an impact hazard is also present.
<b>CONDUCTIVE</b> -Work near or in explosive or hazardous atmospheres.	Explosives manufacturing, grain milling, spray painting or similar work with highly flammable materials.	Conductive footwear.
<b>ELECTRICAL</b> -Work with or near exposed energized electrical wiring or components	Building maintenance; utility work; construction; wiring, work on or near communications, computer or similar equipment and arc or resistance welding.	Electrical hazard safety toe footwear.

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# Appendix E: Hand Protection

## Compliance with National Standards

All personal protective clothing and equipment must be of safe design and construction for the work to be performed and must be maintained in a sanitary and reliable condition.

Hand protection: There are no ANSI standards for glove selection. Glove selection, therefore, must be based on the performance characteristics of the glove in relation to the tasks to be performed.

### General Requirements

The requirements outlined in this program are generally applicable to all LHD operations. Personnel who are involved in research and laboratory operations or that are exposed to blood or other potentially infectious agents, however, should consult the Chemical Hygiene & Biological Plan or Bloodborne Pathogens Programs, as appropriate, for additional requirements. Information on these programs may be obtained by contacting OPHP.

Supervisory personnel or the departmental PPE Coordinator must select and require employees to use appropriate hand protection when the employee's hands are exposed to certain hazards. These hazards include, but are not limited to:

- Work with harmful substances that can be absorbed through the skin, infect non-intact skin or that can cause skin irritation, chemical burns, or similar conditions. Examples would include strong acids or bases and organic solvents. Consult the Material Safety Data Sheet (MSDS) for the product or chemical to determine the type of hand protection that may be needed. Note that employees using these types of products outside of research laboratories must be trained to read and interpret MSDS's. This training may be arranged through OPHP by calling 971-673-0977, or OR-OSHA Consultative Services (1-800-922-2689).
- Work with tools, equipment, or materials that can cause severe cuts, lacerations, punctures, fractures, amputations, or abrasions.
- Work where the employee is exposed to materials or agents that can cause thermal burns or that expose the employee to harmful temperature extremes.

### Selection

Hand protection must be selected based upon a review of the performance characteristics of the hand protection relative to the task(s) to be performed, conditions present, duration of use, and the hazards and potential hazards identified. General guidelines are as follows:

- ✓ Most accidents involving hand and arms can be classified under four main hazard categories: chemical, abrasion, cut, and burns.

**Hazard Communication** - Employees that work with chemicals (including commercial products) outside of research laboratories must be trained on how to read and interpret **MSDS's**.

There are no gloves that provide protection against *all* potential hand hazards, and commonly available glove materials may provide only limited protection against many chemicals. It is important, therefore, to select the most appropriate glove for a particular application and to determine how long it can be worn and whether it can be reused. Note that as long as the performance characteristics of the glove are acceptable, in many cases it may be more cost effective to regularly change cheaper gloves than to reuse more expensive types.

- ✓ When protective hand wear is required for the job to be performed, make sure the gloves fit the employee well, are comfortable to wear, and are rated to guard against the particular hand hazards of the workplace. When selecting gloves for protection against chemical or biological agents, the toxic or infective properties of the agent and the ability to penetrate through the glove must be determined. In particular, chemicals that can cause local effects on the skin and/or pass through the skin and cause systemic effects warrant a higher level of protection.
- ✓ Regardless of material or construction, no glove is completely puncture-proof, nor can any PPE be expected to take the place of proper engineering or work practice controls.
- ✓ Before purchasing gloves, the supervisor or designated representative should review the work activities of the employee to determine the degree of dexterity required, the duration, frequency, and degree of exposure of the hazard, and the physical stresses that will be applied.
- ✓ Generally, any “chemical resistant” glove can be used for dry powders.
- ✓ For mixtures and formulated products (unless specific test data are available), a glove should be selected on the basis of the chemical component with the shortest breakthrough time, since it is possible for solvents to carry active ingredients through some glove materials.
- ✓ Employee must be able to remove the gloves in such a manner as to prevent skin contamination.
- ✓ Store gloves at room temperature—never in extreme heat or cold. Depending upon the material, some manufacturers may specify special storage requirements—check the accompanying literature or contact the supplier for information.
- ✓ Train employees to inspect gloves carefully for discoloration, holes, tears, wear, or other imperfections prior to each use, and require them to report any damage immediately to their supervisor or other designated person.
- ✓ PPE that is contaminated must be disposed of in a manner that will protect employees from exposure to the hazard. Specific questions on disposal requirements should be addressed to OPHP.

## **Types of Hand Protection**

Five general glove types are available: chemical resistant, disposable, cut or abrasion resistant, temperature resistant, or combinations thereof.

### **Chemical Resistant Gloves**

These gloves may be made of rubber, neoprene, polyvinyl alcohol, vinyl, or other materials. The glove protects hands from corrosives, oils, and solvents. The selection of the proper chemical-resistant glove begins with an evaluation of the type of work to be performed and the chemical(s) that will be contacted by the employee. Factors that will influence selection are:

- The type of chemical(s) to be handled or used.
- Frequency and duration of chemical contact.
- Whether the contact will involve total immersion or splash hazards.
- Concentration of the chemical(s).
- Temperature of the chemical(s).
- Abrasion or resistance requirements.
- Puncture, snag, tear, and cut-resistance.
- Area to be protected, and whether it involves only the hand, or if it also includes the forearm and/or arm (see section on Other Considerations).
- The amount of finger or hand dexterity that may be required to do the work.
- Grip requirements, or how well the glove needs to perform under dry, wet, or oily conditions.
- Whether the glove needs to show a color change if it has become contaminated.

- Thermal protection that may be required when handling, for example, cryogenic (i.e. very cold) or superheated materials or liquids.
- Size and comfort requirements.
- The price of the glove.

Different chemicals will affect the protective qualities of a glove in different ways. Select an appropriate glove material based upon:

- **Permeation**, or how quickly a chemical will pass through the glove material.
- **Breakthrough time**, or the time it takes for the chemical to pass to the inside of the glove.
- **Degradation**, or how the chemical will affect the physical properties of the glove material upon contact. Degradation can lead to softening, drying, swelling, shrinkage, or other undesirable side effects that could expose the employee to the chemical.

## Glove Materials

The type of chemical being used is the key factor for choosing the type of material from which the glove should be made. Some of the more common chemical-resistant glove materials are:

- Butyl.** A synthetic rubber with good resistance to weathering and a wide variety of chemicals.
- Neoprene.** A synthetic rubber having chemical and wear-resistance properties superior to those of natural rubber.
- Nitrile.** A copolymer available in a wide range of acrylonitrile (propane nitrile) contents; chemical resistance and stiffness increases with higher acrylonitrile content.
- Polyethylene.** A fairly chemical-resistant material used as a freestanding film or a fabric coating.
- Polyurethane.** An abrasion-resistant rubber that is either coated into fabrics or formed into gloves or boots.
- Polyvinyl alcohol.** A water-soluble polymer that exhibits exceptional resistance to many organic solvents that rapidly permeate most rubbers.
- Polyvinyl chloride.** A stiff polymer that is made softer and more suitable for protective clothing applications by the addition of plasticizers.
- Rubber.** A highly flexible and conforming material made from a liquid tapped from rubber plants.

General guidelines for selecting chemical-resistant gloves are listed in the Selection Chart for Chemical Resistant Gloves located at the end of this Appendix. Consult the manufacturer's literature or contact OPHP for information on the performance of the various classes of gloves versus specific chemicals.

## Disposable Gloves

Disposable gloves are typically discarded after a single wearing, and are not designed to provide long term chemical protection. General types of disposable gloves are:

- Fabric gloves**, usually made of cotton or nylon. These gloves will not generally provide adequate chemical protection, but function well as glove liners.
- Nitrile gloves** can be more chemically resistant than latex or vinyl, and offer good dexterity, elasticity, abrasion resistance, and conform well to the shape of the hand.
- Latex gloves** offer dexterity and conformity, but should only be used in situations involving minimal chemical handling or contact. Some employees may experience an allergic reaction to latex.
- Polyethylene gloves** are generally loose fitting and provide a high degree of dexterity.
- Vinyl gloves** are not as flexible as latex, but offer a looser, less binding fit, and somewhat better chemical resistance than latex.

## Cut and Abrasion-Resistant Gloves

General types of cut and abrasion-resistant gloves are:

- Leather gloves** are used to guard against injuries from abrasions, cuts, extreme temperatures, and sparks (such as occur when welding) or burn hazards. They may be used in combination with an insulated liner when working with electricity.
- Metal Mesh gloves** are used to protect hands from accidental cuts and scratches from extremely sharp objects such as cutting tools or knives.
- Kevlar® gloves** offer exceptional abrasion and burn resistance.
- Aluminized Gloves.** Gloves made of aluminized fabric are designed to insulate your hands from intense heat. Persons working with molten materials most commonly use these gloves.
- Fabric gloves**, usually made from cotton or nylon, do not offer much protection against sharp-edged objects, and may present a snag hazard. These gloves are generally used to protect hands from minimal abrasion hazards, or contact with dirt, grease, or other contaminants.

## Temperature-Resistant Gloves

General types of temperature-resistant gloves are:

- Leather** is a natural insulator, and offers resistance to cuts and abrasion.
- Kevlar®** is cut and abrasion-resistant, and will withstand temperatures up to 600°F.
- Cotton terrycloth** will work effectively at temperatures up to 600°F, though dexterity may be a factor.
- Cryogenic** gloves offer protection against extremely low temperatures, but are not suitable for immersion in liquid nitrogen or for use near open flames.
- Rubber** offers protection against cold temperatures, but will not stand up well to heat.
- Other temperature-resistant gloves, including Nomex®, Zetex®, and Flextra®, are available. The manufacturer's literature should be consulted for specific applications.

## Glove Linings

Glove linings will tend to improve comfort by absorbing perspiration, but may decrease dexterity. However, in the case of a primary glove breach some linings may cause a chemical to be wicked through the primary glove, keeping the chemical closer to the skin for a longer period of time.

General types of linings consist of:

- Unlined** gloves offer greater sensitivity and dexterity.
- Flock** linings, or linings of shredded fibers, improve absorption of perspiration.
- Knit** linings absorb perspiration, and may improve temperature protection.
- Jersey** linings are generally more comfortable and provide better cushioning than other linings.
- Foam** linings may be used to improve temperature protection for hot or cold conditions.
- Wool** linings are natural insulators used outdoors for warmth in cold temperatures.

## Glove Length

- Finger cots** -- worn on the fingers alone when only minimal protection is required, such as when handling small parts that do not present a hazard to the rest of the hand.
- Wrist length** (9-14") – protects both the hand and wrist from exposure.
- Elbow length** (14-18") – provide protection if the hand must be immersed in a liquid or extra splash protection, and also shields the forearm from heat hazards, abrasions, or chemicals.
- Shoulder length** (30-31") – protects the entire arm from exposure.

## Cuff Style

- Rolled cuffs** – provide a barrier to keep chemicals on the glove from running onto your skin.
- Straight cuffs** – provide extra length and a snug fit to protect from chemical runoff.
- Slip-on or open cuffs** – make it easier to put on and take off the glove.
- Safety cuffs** – provide additional wrist protection, and improve cut and abrasion resistance.
- Gauntlet-style cuffs** – support a looser fit, and allow greater movement of the forearm to improve comfort.
- Knit wrist cuffs** – improve the fit of the glove at the opening to prevent materials from entering the glove.

## SELECTION CHART FOR CHEMICAL RESISTANT GLOVES\*

TYPE	ADVANTAGES	DISADVANTAGES	USE AGAINST
Natural rubber	Low cost, good physical properties, good dexterity	Poor vs. oils, grease, organics. Frequently imported and may be poor quality.	Bases, alcohol, dilute water solutions; fair versus aldehydes and ketones.
Natural rubber blends	Low cost, good dexterity, better chemical resistance than natural rubber versus some chemicals.	Physical properties frequently inferior to natural rubber.	Same as natural rubber
Polyvinyl chloride (PVC)	Low cost, very good physical properties, medium cost, medium chemical resistance	Plasticizers can be stripped; frequently imported and may be poor quality	Strong acids and bases, salts, other water solutions, alcohol
Neoprene	Medium cost, medium chemical resistance, medium physical properties	NA	Oxidizing acids, aniline, phenol, glycol ethers
Nitrile	Low cost, excellent physical properties, dexterity	Poor versus benzene, methylene chloride, trichloroethylene, many ketones	Oils, greases, aliphatic chemicals, xylene, perchloroethylene, trichloroethane; fair versus toluene
Butyl	Specialty glove, polar organic	Expensive, poor versus hydrocarbons, chlorinated solvents	Glycol ethers, ketones, esters
Polyvinyl alcohol (PVA)	Specialty glove, resists a very broad range of organics, good physical properties	Very expensive, water sensitive, poor versus light alcohols	Aliphatics, aromatics, chlorinated solvents, ketones (expect acetone), esters, ethers
Fluoro-elastomer- (viton®)	Specialty glove, organic solvents	Extremely expensive, poor physical properties, poor vs. some ketones, esters, amines	Aromatics, chlorinated solvents, also aliphatics and alcohols
Nofoil (silver shield®)	Excellent chemical resistance	Easily punctures, poor grip, stiff	Use for hazardous materials work, or work involving multiple chemical hazards

\* Contact the supplier or manufacturer for information on glove materials that should be used for specific chemicals.

If working with infectious or bio-toxic material and there is the potential for employee exposure, you may wish to call on Oregon State Public Health Laboratory at: 503-693-4100 or Oregon Public Health Division, Acute and Communicable Disease Program at: 971-673-1111, for advice and recommendations. Information on protective gloves required for work involving infectious materials or bloodborne pathogens may be obtained by contacting the Industrial Hygienist in OEPH at 971-673-0977, or OR-OSHA Consultative Services (1-800-922-2689).

# Appendix F: Protective Clothing and Body Protection

## Compliance with National Standards

All personal protective clothing and equipment must be of safe design and construction for the work to be performed, and it must be maintained in a sanitary and reliable condition. Standards are not currently available for all types of protective clothing or body protection. Where such standards do exist, only those items of protective clothing and equipment that meet *NIOSH*, *ANSI*, *ASTM*, or *NFPA* standards, as appropriate, may be used. Questions regarding the suitability of a specific item for a given hazard should be referred either to the manufacturer or OPHP.

### General Requirements

Contact OPHP at 971-673-0977, or OR-OSHA Consultative Services (1-800-922-2689) for guidance prior to beginning work when protective clothing is required to conduct research operations or is required for work involving infectious materials or bloodborne pathogens. When protective clothing is subject to contamination with toxic or a hazardous substance it may not be removed from the work area, and must be disposed of properly and in a manner that protects employees from exposure to the hazard.

Care should be exercised in protective clothing selection, since some protective clothing has very limited resistance to chemicals or fire. Consult the Material Safety Data Sheet (MSDS) to determine the recommended clothing for a particular chemical or chemical mixture. The department must provide body protection for employees if they are threatened with bodily injury while performing their jobs, and if engineering, work practice, and administrative controls have failed to eliminate these hazards. Workplace hazards that could cause bodily injury include the following:

- Exposure to intense heat or cold. Note that cold weather clothing is generally considered to be normal wear clothing and is not covered by this program.
- Splashes of very cold or very hot metals or liquids.
- Impacts from tools, machinery, or materials.
- Cuts and/or abrasion.
- Exposure to hazardous chemicals.
- Contact with potentially infectious materials like blood.
- Radiation.
- Exposure to electrical arc hazards.

### Types of Clothing and Body Protection

As with all protective equipment, protective clothing is available to protect against specific hazards. The department is required to provide personal protective clothing/equipment only for the parts of the body exposed to possible injury. The protective clothing provided must be constructed of material that will protect against the specific hazards in the workplace. Materials used in protective clothing include the following:

- Paper-like fiber.** Disposable suits made of this material provide protection against dust and varying protection against splash hazards. Disposable suits may be coated with a material to increase chemical or water resistance. Uncoated disposable suits are typically only suitable for protection from contamination with particulate hazards (e.g., asbestos or lead).
- Treated wool and cotton.** Protective clothing made from treated wool and cotton adapts well to changing workplace temperatures and is comfortable as well as fire resistant. Treated cotton and wool clothing protects against dust, abrasions, and rough and irritating surfaces.
- Duck.** This closely woven cotton fabric protects employees against cuts and bruises while they handle heavy, sharp, or rough materials.

- ❑ **Leather.** Leather protective clothing is often used to protect against dry heat and flame such as are encountered during grinding and welding operations.
- ❑ **Rubber, rubberized fabrics, neoprene, and plastics.** Protective clothing made from these materials protects against certain acids and chemicals.
- ❑ **Specialized protective clothing** may incorporate Kevlar for cut resistance (for example, chainsaw chaps), aluminized coatings for protection from radiant heat, and flame-retardant or resistant coatings or materials.
- ❑ **Electrical hazard clothing.** Special clothing may be required for persons exposed to electrical arc hazards and/or extreme temperatures resulting from an electrical arc. This clothing is nonconductive and contains no metal hardware. Extreme exposure may necessitate use of an ultraviolet/infrared flash hood.
- ❑ **Cooling vests or jackets.** Cooling vests or jackets provide protection from heat exhaustion or heat stroke when employees work in very hot environments or conditions. Be aware that different materials will protect against different chemical and physical hazards. When chemical or physical hazards are present, check with the clothing manufacturer to make sure that the material selected will provide protection from the specific chemical or physical hazards in your workplace or contact OPHP for guidance. Many types of protective clothing restrict airflow and impede perspiration. The risk of heat exhaustion or heat stroke, therefore, may be greatly increased with some types of protective clothing. Employee training on the symptoms of heat stress and the use of engineering controls (e.g., increasing ventilation), administrative controls (e.g., employee rotation), and personal protective equipment (e.g., cooling vests) may be essential to assuring employee safety in hot work environments.

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# Appendix G – Fall Protection, Hearing Protection, Respiratory Protection, and Electrical Protective Devices

## **Fall Protective Devices**

The local health department administers their Fall Protection Program. Only personnel that have been trained by approved sources may perform work requiring the use of fall protective devices. Personnel who perform work on a surface with an unprotected side or edge that is 6 feet or more above a lower level, or 10 feet or more on scaffolds, must be protected from falling by the use of guardrails, safety nets, or personal fall arrest systems. The exact requirements for when fall protective devices are required should be consulted prior to performing the work. Advice on proper procedures is available either from OR-OSHA Consultative Services (1-800-922-689), or from OPHP (971-673-0977).

The use of body belts for fall protection and the use of non-locking snaphooks are prohibited as of January 1, 1998.

If you identify that an employee is exposed to potential fall hazards during the hazard assessment process, contact OPHP for guidance at 971-673-0977, or OR-OSHA Consultative Services (1-800-922-2689).

## **Hearing Protective Devices**

Noise measurements must be made to determine if employees are being overexposed and to identify the machines or work processes that are contributing to the exposure. If it is discovered that a worker is exposed to an excessive amount of noise, these measurements are needed to determine the proper hearing protection device (HPD) that needs to be used and if engineering and/or administrative controls need to be implemented. Accurate exposure measurements are also needed so that the affected employee(s) can be included in the Hearing Conservation Program if they are exposed to excessive noise levels.

If you suspect that an employee may be exposed to excessive noise levels based upon the hazard assessment that you perform, or there is indication of a high noise hazard, such as to carry on with a conversation about five feet away from someone requires raising your voice, contact OPHP for guidance and technical assistance at 971-673-0977, or OR-OSHA Consultative Services (1-800-922-2689). Until such time as the evaluation has been performed, you should provide the potentially exposed employee with hearing protective devices to limit his or her exposure.

## **Respiratory Protective Devices**

The Respirator Program Administrator (RPA) is designated by the Local Health Department Administrator. The RPA will maintain the Local Health Department's written Respiratory Protection Program. The designated RPA person's name, working location and contact number are forwarded to the OPHP Industrial Hygienist.

Local Health Department employees will be included in the Respiratory Protection Program when it is suspected that they are exposed to respiratory hazards that can not be alleviated with engineering controls (e.g. ventilation, process confinement, or material substitutions). Respirators may be used only in cases where alternative controls are not feasible or are in the process of being implemented. Respirators may *not* be provided to an employee if they are not approved for respirator use by the designated RPA. This Respiratory Protection Program provides services free of charge to Local Health Department employees and

paid intern students that are exposed to certain types of hazards and require the use of a respirator. Services that pertain specifically to the respiratory protection program include medical evaluation, fit testing, hazard monitoring, training and the placing orders for equipment. These services are provided only when entry into the respiratory protection program is required due to hazards in the workplace or in response to airborne hazards in the field. Respiratory protection will be required if it is determined that airborne/biological/radiological contaminants which pose a health hazard are present in the workplace or as part of work related activity in the field.

If you suspect that an employee may be exposed to an airborne agent (e.g., dust/mist/fume/vapor) respiratory hazard based upon the hazard assessment that you perform, contact OPHP for guidance at 971-673-0977, or OR-OSHA Consultative Services (1-800-922-2689).

## **Electrical Protective Devices**

If an employee in your department performs premise wiring or other electrical work on exposed energized electrical conductors, they must abide by the requirements outlined in the OPHP Electrical Safety Program. These employees must be trained to the level of *qualified person*, use appropriate lockout and tagout procedures, and use appropriate electrical protective devices. Information on the electrical safety program, lockout/tagout program, and electrical protective devices may be obtained by contacting OPHP at 971-673-0977, or OR-OSHA Consultative Services (1-800-922-2689).

*Qualified person* – a person who has received appropriate training and has demonstrated the necessary skills and techniques to perform his or her work safely. A qualified person skill set must be evaluated by a licensed electrician before allowed to perform electrical work. Skill set must be defined to allow safe work and know limitations of ability.



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## Appendix I – Who Pays for PPE?

Protective equipment, including personal protective equipment for eyes, face, head and extremities, protective clothing, respiratory devices, and protective shields and barriers, must be provided, used, and maintained in a sanitary and reliable condition.

The department, division or section must provide most types of PPE at no cost to the employee. PPE that is very personal in nature and that can be worn off the jobsite — specifically some types of safety footwear and safety eyewear — may be partially or fully funded at the discretion the department.

- ✓ It is recommended that each department maintain a uniform policy for reimbursement of safety footwear and eyewear.
- ✓ Departments are encouraged to fully reimburse the cost of safety footwear and eyewear. This will assure that adequate and appropriate PPE is provided to and will be used by the employee.
- ✓ If the department elects to reimburse only a portion or none of the cost of safety footwear or eyewear, it is recommended that the requirement that the employee provide this PPE be included in the position description and that this requirement be fully explained during the interview process.

### **Safety Footwear**

Specialized safety footwear, such as electrical protective, conductive, chemical resistant, foundry/heat resistant footwear or footwear with metatarsal protection must be provided at no cost to the employee. Reimbursement for the purchase of all other types of safety footwear is at the discretion of the department.

If the department, division or section elects to reimburse none or only a portion of the cost of safety footwear, remember that you are still obligated to assure the adequacy of this PPE for the hazards to which they are exposed.

### **Safety Eyewear**

Specialized safety eyewear, such as prescription lenses that are fitted to full-face respirators, laser protective eyewear, welding helmets, and face shields, must be provided at no cost to the employee. Reimbursement for impact resistant prescription safety eyewear is at the discretion of the department, division or section. If the department elects to reimburse none or only a portion of the cost of safety eyewear, remember that you are still obligated to assure the adequacy of this PPE for the hazards to which they are exposed.