



**University of Illinois at Urbana-Champaign  
Personal Protective Equipment Program**

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**Prepared by:**  
**Division of Safety and Compliance**  
**Occupational Safety and Health Department**  
**1501 S. Oak St.**  
**Champaign, IL 61820**  
**(217) 265-9828**

**Division of Research Safety**  
**102 Environmental Health & Safety Bldg.**  
**101 S. Gregory Street**  
**Urbana, IL 68101**  
**(217) 333-2755**

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## **PURPOSE**

The University of Illinois at Urbana-Champaign (University), through the Division of Safety and Compliance (S&C), Occupational Safety and Health Department (OSH) and the Division of Research Safety (DRS), has established this Personal Protective Equipment (PPE) Program (Program) to protect the health and safety of university students, faculty, and staff and to ensure compliance with State and Federal occupational safety and health standards.

PPE devices are not to be relied on as the only means to protect against hazards. The best approach is to abate the hazard first through engineering and administrative controls (change in process, elimination of process, chemical substitution, etc.). If hazards cannot be controlled with these methods, PPE should then be used to provide worker protection. This Program will be used in conjunction with other University policies and procedures involving the protection of students, faculty, and staff.

## **POLICY**

It is the policy of the University to provide its students, faculty, and staff with a safe and healthful working environment. This is accomplished as far as feasible with accepted engineering controls, work practice and administrative controls to reduce hazardous exposure to safe levels. Where these methods are not feasible or adequate, personal protective equipment is provided to reduce employee exposure levels.

The PPE Program applies to all students, faculty, and staff where PPE must be used to protect against hazards that were unable to be controlled through alternative means. This Program provides the University community with information necessary to identify work situations that require the use of PPE, properly select and use PPE, and establish the means for documentation of this information in unit-specific procedures.

## **RESPONSIBILITIES**

### **Occupational Safety and Health (OSH) and Division of Research Safety (DRS)**

Campus safety units (OSH and DRS) are responsible for the administration of this program as it applies to student, faculty, and staff exposures to hazards (e.g., electrical shock, noise, falling/flying objects, chemicals, biohazardous materials, lasers, radioactive materials, etc.). The Campus safety units can, upon request, provide or assist with general awareness training, hazard assessments and recommendations for appropriate selection of PPE. Additionally, the Campus safety units will provide regulatory interpretation and review this Program annually.

### **Deans, Department Heads, and Directors (Campus Units)**

Deans, Department Heads, and Directors will demonstrate a commitment, both fiscal and managerial, towards the implementation of the PPE Program. They will establish budgetary support for this program for their individual department(s) and ensure the PPE Selection Guidelines are implemented and maintained within their department(s).

### **Supervisors of Affected Employees**

Supervisors are responsible for contacting OSH or DRS with questions about the type of PPE required for a task and conduct or arrange for the appropriate selection and fitting of PPE. Supervisors are

responsible for ensuring a Job Hazard Assessment (JHA) or other hazard assessment documentation that requires PPE is developed and maintained for activities under their supervision. Supervisors must ensure employees receive training on the proper selection, storage, use and maintenance of PPE when employees they supervise are required to use such equipment. Supervisors must ensure retraining if:

- Changes in the workplace render previous training obsolete;
- Changes in the types of PPE to be used render previous training obsolete;
- Inadequacies in an affected employee's knowledge or use of assigned PPE indicate that the employee has not retained the requisite understanding or skill.

Supervisors are responsible for conducting or arranging for PPE-specific training, documenting, and maintaining training records. Supervisors are also responsible for supplying the appropriate PPE to employees and ensuring it is worn according to the training provided. Supervisors must assure the requirements of this program are observed with respect to hazard surveys, testing, training and record keeping.

### **Employees**

Employees are responsible for reporting to the supervisor any operation or job for which they suspect that PPE may be needed. Employees are also responsible to attend training on PPE as required by this program. Further, they are responsible to use PPE in accordance with instruction and training received as necessitated by job hazard assessments. Employees should not use any PPE with deficiencies and should report any deficiencies or malfunctions to a supervisor. Employees should notify their supervisor if they experience a noticeable change in health while wearing their PPE or experience a potential problem with their PPE.

## **PROCEDURES**

### **The Hazard Assessment**

An assessment of the workplace is used to determine if hazards are present, or are likely to be present, and necessitate the use of PPE. When conducting a hazard assessment, a task is identified, investigated and potential hazards determined. Potential hazards may be physical or health-related. Examples of physical hazards include moving objects, fluctuating temperatures, rolling or pinching objects, electrical connections and sharp edges. Examples of health hazards include overexposure to harmful dusts, chemicals or radiation. The hazard assessment may be conducted for an individual employee, performing a single task, or a group of employees if all the employees perform an identical task. The assessment should be documented

The hazard assessment should begin with a walk-through survey of the facility to develop a list of potential hazards. Areas to consider include:

- Sources of electricity;
- Sources of motion such as machines or processes where movement may exist that could result in an impact between personnel and equipment;
- Sources of high temperatures that could result in burns, eye injuries or fire;
- Types of chemicals used in the workplace;
- Sources of harmful dusts;

- Sources of light radiation, such as welding, brazing, cutting, furnaces, heat treating, high intensity lights, etc.;
- The potential for falling or dropping objects;
- Sharp objects that could poke, cut, stab or puncture; and
- Biological hazards such as blood or other potentially infectious material.

### **Hazard Assessment Documentation**

A workplace hazard assessment must be performed through a written certification that identifies the workplace evaluated, the person certifying that the evaluation has been performed and the date(s) of the hazard assessment. The Job Hazard Assessment form (Appendix A) is one tool that satisfies the assessment process has been completed as required by regulations. This assessment assures that potential workplace hazards and appropriate controls, including PPE, have been identified. Completed assessment forms shall be maintained by the department and available to the employee. All hazard control selection decisions, including selection of PPE, must be communicated to the affected employees.

The completed assessment form must identify the following:

- The workplace and employee (group) evaluated
- The date of the assessment
- The person certifying the assessment has been performed
- The hazards found
- The engineering and administrative controls selected
- The selected PPE

In laboratories, Standard Operating Procedures and other [lab-specific training](#) in the [Laboratory Safety Plan](#) are considered types of Hazard Assessments as long as the required information is present.

### **Reassessment**

The workplace should be periodically reassessed for any changes in conditions, equipment or operating procedures that could affect occupational hazards. The suitability of existing PPE, including an evaluation of its condition and age, should be included in the reassessment. Other documentation, such as near miss and injury/illness reports should also be reviewed as part of the reassessment.

### **PPE Selection Guidelines**

PPE must be selected that will protect the employee from each hazard identified in the assessment that cannot be controlled through the use of engineering or administrative controls. The PPE Worksheet (Appendix B) will assist in this process.

The PPE selected must fit the employee it is intended to protect; employees should have the correct size of protective equipment. Whenever possible, adjustable PPE should be procured. Personal protective equipment that fits properly and is comfortable will more likely be worn by employees. PPE that doesn't fit properly does not perform effectively, leaving workers exposed to the hazards the PPE is designed to protect against.

See the campus [Hearing Protection Program](#) for requirements for use of hearing protection devices.

See the campus [Respiratory Protection Program](#) for requirements of use of respiratory protection.

See the campus [Elevated Work Program](#) for requirements for use of personal fall protection systems.

See the DRS [Personal Protective Equipment](#) page for information about common laboratory PPE.

### **PPE Care, Use and Maintenance**

Whenever practical, PPE will be assigned to individual workers for their exclusive use. Employees will be responsible for the PPE equipment assigned to them or used by them.

Employees will be regularly clean, inspect and store their PPE according to manufacturer care and use instructions, instructions given during the training sessions, or as directed by supervisors. Defective or damaged PPE shall not be used. Employees are to report any defective or damaged equipment to their supervisor for repair or replacement. Damaged or defective protective equipment must be taken out of service immediately to be repaired or replaced and employees must be provided with proper equipment in the interim.

### **TRAINING**

Training must be provided for employees who are required to wear PPE. Retraining must also be provided when changes in the workplace that render prior training obsolete, changes in the types of PPE used, and inadequacies in the worker's knowledge or use of PPE that indicate the worker had not retained the requisite understanding and skill.

Training is available in two phases, general and unit-specific. General awareness PPE training is provided by OSH (live for fall protection, hearing protection, respiratory protection, and other physical hazards) and DRS (online for chemical hazards, infectious or potentially infectious materials, radiological hazards, and lasers) for all employees who wear PPE.

All general PPE training includes:

- When and why personal protective equipment is necessary;
- What type of personal protective equipment is necessary;
- General instructions on how properly to don, doff, adjust and wear personal protective equipment;
- The limitations of the personal protective equipment;
- The proper care, maintenance, useful life and disposal of the personal protective equipment.

General PPE training provided online by DRS is included in the following training modules:

- Laboratory Safety Training; and
- Hazard Communication Training.

Unit-specific training shall include:

- What type of PPE is necessary for each job;

- How properly to don, doff, adjust and wear the designated PPE;
- Limitations of the PPE, especially within the parameters of the particular hazards;
- Proper care, maintenance, useful life, and disposal of the PPE; and
- How to obtain PPE.

Unit-specific training must be conducted by the supervisor or other designated person, and documented. Each trainee shall demonstrate an understanding of the PPE training as well as the ability to properly wear and use PPE before being allowed to perform work requiring the use of the PPE.

### **Training Documentation**

Campus units must document that employees have received and understood the required PPE training. The training records must include the name of the worker(s) trained, the date(s) of training, and the subject of the training. Use the PPE Training Documentation Form in Appendix C to document PPE-specific training provided by the Campus unit. The training documentation verifies that employees have received the necessary training and know how to properly use PPE. OSHA compliance officers may require employers to disclose training records during an Agency inspection. Departments will maintain their own training records.

**APPENDIX A – JOB HAZARD ASSESSMENT TEMPLATE**

Job Title:		Job Location:		Reviewer:		Date:	
						Unit/Dept.:	
Task:							
Training Requirements:							
<b>1</b>		<b>2</b>		<b>3</b>		<b>4</b>	
Basic Job Steps		Potential Hazards		Hazard Control		PPE Requirements	

APPENDIX B – PPE WORKSHEET

EYE/FACE HAZARDS	YES	NO	REQUIRED PPE – EYE/FACE
Flying debris	<input type="checkbox"/>	<input type="checkbox"/>	
Hot Sparks	<input type="checkbox"/>	<input type="checkbox"/>	
Molten metal splash	<input type="checkbox"/>	<input type="checkbox"/>	
High temperature	<input type="checkbox"/>	<input type="checkbox"/>	
Droplets/sprays splash	<input type="checkbox"/>	<input type="checkbox"/>	
Irritating mist	<input type="checkbox"/>	<input type="checkbox"/>	
Nuisance dust	<input type="checkbox"/>	<input type="checkbox"/>	
Fine dust	<input type="checkbox"/>	<input type="checkbox"/>	
Infrared radiation	<input type="checkbox"/>	<input type="checkbox"/>	
Visible light (glare)	<input type="checkbox"/>	<input type="checkbox"/>	
Ultraviolet radiation	<input type="checkbox"/>	<input type="checkbox"/>	
Arc Welding Arc	<input type="checkbox"/>	<input type="checkbox"/>	
Furnace/boiler electric arc	<input type="checkbox"/>	<input type="checkbox"/>	
Oxygen gas welding	<input type="checkbox"/>	<input type="checkbox"/>	
Oxyfuel/oxygen cutting	<input type="checkbox"/>	<input type="checkbox"/>	
Torch brazing	<input type="checkbox"/>	<input type="checkbox"/>	
Torch soldering	<input type="checkbox"/>	<input type="checkbox"/>	
Glare	<input type="checkbox"/>	<input type="checkbox"/>	
Other:	<input type="checkbox"/>	<input type="checkbox"/>	
Other:	<input type="checkbox"/>	<input type="checkbox"/>	
Required Eye/Face PPE might include gloves (various types), protective sleeves, long-sleeved shirts, etc.			
NOISE HAZARDS?	YES	NO	REQUIRED PPE - HEARING
Loud noises/environment	<input type="checkbox"/>	<input type="checkbox"/>	
Noisy machines/tools	<input type="checkbox"/>	<input type="checkbox"/>	
Heavy equipment	<input type="checkbox"/>	<input type="checkbox"/>	
Other:	<input type="checkbox"/>	<input type="checkbox"/>	
Other:	<input type="checkbox"/>	<input type="checkbox"/>	
Noisy environments, equipment, and machinery should be assessed by the Occupational Safety and Health Department (OSH). If no noise assessment has been performed by OSH, please complete the form at <a href="http://go.illinois.edu/NoiseAssessmentRequest">http://go.illinois.edu/NoiseAssessmentRequest</a> .			
Required Hearing PPE might include ear plugs, ear muffs, etc.			

HAND HAZARDS?	YES	NO	REQUIRED PPE - HAND
Absorption of harmful substances	<input type="checkbox"/>	<input type="checkbox"/>	
Severe cuts or lacerations	<input type="checkbox"/>	<input type="checkbox"/>	
Severe abrasions	<input type="checkbox"/>	<input type="checkbox"/>	
Punctures	<input type="checkbox"/>	<input type="checkbox"/>	
Chemical burns/absorption	<input type="checkbox"/>	<input type="checkbox"/>	
Blood/Infectious material	<input type="checkbox"/>	<input type="checkbox"/>	
Thermal burns	<input type="checkbox"/>	<input type="checkbox"/>	
Temperature extremes	<input type="checkbox"/>	<input type="checkbox"/>	
Electricity	<input type="checkbox"/>	<input type="checkbox"/>	
Other:	<input type="checkbox"/>	<input type="checkbox"/>	
Other:	<input type="checkbox"/>	<input type="checkbox"/>	
Required Hand PPE might include chemical-resistant gloves (various types), cut-resistant gloves (various types), voltage-rated gloves, etc.			
FOOT HAZARDS?	YES	NO	REQUIRED PPE - FOOT
Corrosive materials	<input type="checkbox"/>	<input type="checkbox"/>	
Poisonous materials	<input type="checkbox"/>	<input type="checkbox"/>	
Absorption of harmful substances	<input type="checkbox"/>	<input type="checkbox"/>	
Electrical hazards	<input type="checkbox"/>	<input type="checkbox"/>	
Heavy objects rolling/falling	<input type="checkbox"/>	<input type="checkbox"/>	
Punctures	<input type="checkbox"/>	<input type="checkbox"/>	
Molten metal splash	<input type="checkbox"/>	<input type="checkbox"/>	
Hot surfaces	<input type="checkbox"/>	<input type="checkbox"/>	
Slippery surfaces	<input type="checkbox"/>	<input type="checkbox"/>	
Extreme cold	<input type="checkbox"/>	<input type="checkbox"/>	
Blood/Infectious material	<input type="checkbox"/>	<input type="checkbox"/>	
Electrostatic discharge explosion	<input type="checkbox"/>	<input type="checkbox"/>	
Other:	<input type="checkbox"/>	<input type="checkbox"/>	
Other:	<input type="checkbox"/>	<input type="checkbox"/>	
Required Foot PPE might include chemical-resistant shoe covers (various types), hard-toe safety shoe/boot, integral or insertable steel shanks, conductive shoes, etc.			

HEAD HAZARDS?	YES	NO	REQUIRED PPE - HEAD
Overhead beams	<input type="checkbox"/>	<input type="checkbox"/>	
Overhead pipes	<input type="checkbox"/>	<input type="checkbox"/>	
Insulating blanket	<input type="checkbox"/>	<input type="checkbox"/>	
Exposed electrical	<input type="checkbox"/>	<input type="checkbox"/>	
Falling objects	<input type="checkbox"/>	<input type="checkbox"/>	
Machine parts	<input type="checkbox"/>	<input type="checkbox"/>	
Other:	<input type="checkbox"/>	<input type="checkbox"/>	
Other:	<input type="checkbox"/>	<input type="checkbox"/>	
Required Head PPE might include protective helmets (various types), bump caps, etc.			
BODY HAZARDS?	YES	NO	REQUIRED PPE - BODY
Heavy equipment	<input type="checkbox"/>	<input type="checkbox"/>	
Traffic	<input type="checkbox"/>	<input type="checkbox"/>	
Particulates	<input type="checkbox"/>	<input type="checkbox"/>	
Chemical burns/absorption	<input type="checkbox"/>	<input type="checkbox"/>	
Poisonous materials	<input type="checkbox"/>	<input type="checkbox"/>	
Absorption of harmful substances	<input type="checkbox"/>	<input type="checkbox"/>	
Electrical hazards	<input type="checkbox"/>	<input type="checkbox"/>	
Molten metal splash	<input type="checkbox"/>	<input type="checkbox"/>	
Hot surfaces	<input type="checkbox"/>	<input type="checkbox"/>	
Extreme cold	<input type="checkbox"/>	<input type="checkbox"/>	
Blood/Infectious material	<input type="checkbox"/>	<input type="checkbox"/>	
Other:	<input type="checkbox"/>	<input type="checkbox"/>	
Other:	<input type="checkbox"/>	<input type="checkbox"/>	
Required Body PPE might include Arc-rated clothing, chemical-resistant aprons or coveralls (various types), welding jacket, etc.			
RESPIRATORY HAZARDS?	YES	NO	REQUIRED PPE - RESPIRATORY
Dust or particulate	<input type="checkbox"/>	<input type="checkbox"/>	The Occupational Safety and Health Department (OSH) must evaluate respiratory hazards and select the appropriate respiratory protection before a respirator can be worn.  If no respiratory protection assessment has been performed by OSH, please complete the form at <a href="http://go.illinois.edu/respirator_request">http://go.illinois.edu/respirator_request</a> .
Toxic gas/vapor	<input type="checkbox"/>	<input type="checkbox"/>	
Pesticides	<input type="checkbox"/>	<input type="checkbox"/>	
Other:	<input type="checkbox"/>	<input type="checkbox"/>	
Other:	<input type="checkbox"/>	<input type="checkbox"/>	
Required Respiratory PPE might include dust mask, ½ mask, full mask, PAPR, SCBA, etc.			

FALL HAZARDS?	YES	NO	REQUIRED PPE - FALL
Unprotected sides/edges > 4'	<input type="checkbox"/>	<input type="checkbox"/>	<p>Fall hazards controlled using personal fall protection system (PFPS) must be evaluated by a Fall Protection Competent Person before employee exposure to the fall hazard and wearing of PFPS.</p> <p>Contact your unit level safety contact to have the fall hazard assessed.</p> <p>PPE might include harness, lanyard, temporary anchor points, etc.</p>
Leading edges	<input type="checkbox"/>	<input type="checkbox"/>	
Holes	<input type="checkbox"/>	<input type="checkbox"/>	
Openings	<input type="checkbox"/>	<input type="checkbox"/>	
Ramp/Runway/Walkway	<input type="checkbox"/>	<input type="checkbox"/>	
Dangerous Equipment	<input type="checkbox"/>	<input type="checkbox"/>	
Vertical Ladder > 24'	<input type="checkbox"/>	<input type="checkbox"/>	
Other:	<input type="checkbox"/>	<input type="checkbox"/>	
Other:	<input type="checkbox"/>	<input type="checkbox"/>	



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**APPENDIX D – ADDITIONAL PPE INFORMATION**

Personal protective equipment in the categories listed in this appendix must meet current cited American National Standards Institute (ANSI) or American Society for Testing and Materials (ASTM) standards. Existing PPE stocks must meet the ANSI or ASTM standard in effect at the time of its manufacture or provide protection equivalent to PPE manufactured according to ANSI or ASTM criteria. This appendix contains information on the following:

- Eye and Face Protection
- Head Protection
- Foot Protection
- Glove Protection
- Electrical Protective Devices
- Protective Clothing

**Eye and Face Protection: ANSI Z87.1, NFPA 70E**

Eye and face protection shall be required where there is a reasonable probability that injury could be prevented by such protection.

- The employer shall ensure that each affected employee uses appropriate eye or face protection when exposed to eye or face hazards from flying particles, molten metal, liquid chemicals, acids or caustic liquids, chemical gases or vapors, or potentially injurious light radiation.
- The employer shall ensure that each affected employee uses eye protection that provides side protection when there is a hazard from flying objects. Detachable side protectors (e.g. clip-on or slide-on side shields) meeting the pertinent requirements of this section are acceptable.
- The employer shall ensure that each affected employee who wears prescription lenses while engaged in operations that involve eye hazards wears eye protection that incorporates the prescription in its design, or wears eye protection that can be worn over the prescription lenses without disturbing the proper position of the prescription lenses or the protective lenses.
- The employer shall ensure that each affected employee uses equipment with filter lenses that have a shade number appropriate for the work being performed for protection from injurious light radiation.
- Chemical splash goggles (those with indirect ventilation on sides) are required where protection is needed against chemical splashes or sprays. These may also be used where impact protection is required.
- Where the potential exists for an arc flash, the NFPA 70E standard should be referenced for the proper protective eyewear. It requires an analysis, which includes procedures for determining an electrically safe work condition, a determination of the flash protection boundary and the PPE required for workers that will be within the boundary. An electrically safe work condition is one in which equipment has been deenergized and a proper lockout/tagout has been performed.

Before wearing impact goggles or glasses, inspect them for weaknesses, cracks, scratches, weak elastic band, and other damage or defect as prescribed by the manufacturer, and replace them if they are flawed, will not stay in place, or impair vision. When lenses become severely scratched or pitted they

should be replaced. Frames and elastic bands should be replaced when they become worn or broken. Goggles and glasses should be kept clean with mild soap and water, and stored in a dry, temperate atmosphere out of harm's way. Avoid hanging eyewear by the elastic band as this can significantly weaken the band in a short time. If protective eyewear items are not contaminated with chemical, biological, or radioactive material, there are no special disposal considerations; they are regular trash.

**Head Protection: ANSI Z89.1-2014**

The employer shall ensure that each affected employee wears a protective helmet when working in areas where there is a potential for injury to the head from falling objects. The employer shall also ensure that a protective helmet designed to reduce electrical shock hazard is worn by each such affected employee when near exposed electrical conductors which could contact the head.

Hard hats should be used when falling object hazards may result from activities with proximity to:

- persons or operations where accidental dropping or loss of material, tools, equipment or other articles could lead to a head injury;
- a barricaded or posted demolition or construction area where head hazards exist;
- objects stored on shelves, platforms, etc. that may fall and cause head injury; or
- overhead exposed energized conductors nearby.

ANSI Hard Hat Classes: The three classes are based on the level of protection they provide from electrical hazards.

- Class G (General) hard hats are rated for 2,200 volts (equivalent to the old Class A). Good impact protection, but limited voltage protection.
- Class E (Electrical) hard hats are rated for 20,000 volts (equivalent to the old Class B). Protect against falling objects, high-voltage shock/burns.
- Class C (Conductive) Designed for comfort, offer limited protection.
- Protects heads that may bump against fixed objects, but do not protect against falling objects or electrical shock.

Each hard hat must have the following information clearly marked inside the hat:

- Manufacturer's name
- ANSI standard that the hard hat conforms with, such as "ANSI Z89.1"
- ANSI type (type I or II) and class designation (G, E or C)
- Size range for fitting
- Date of manufacture

Hard hats with any of the following defects should be removed from service and replaced:

- Perforation, cracking, or deformity of the brim or shell;
- Indication of exposure of the brim or shell to heat, chemicals or ultraviolet light and other radiation (in addition to a loss of surface gloss, such signs include chalking or flaking).

Always replace a hard hat if it sustains an impact, even if damage is not noticeable. Suspension systems are offered as replacement parts and should be replaced when damaged or when excessive wear is noticed. It is not necessary to replace the entire hard hat when deterioration or tears of the suspension

systems are noticed. Never mix suspensions and shells from different manufacturers. Use warm soap and water to clean the helmet as necessary.

Hard hat headbands and chin and nape straps should be adjusted to keep the hat comfortably on the head. Liners or sweatbands can be added for warmth or cooling. The shell or other parts of the hat should be replaced when they become damaged. Clean hats by dipping in hot water with detergent, scrub the shell and rinse in clear hot water. Cleaning solvents may damage the shell.

### **Foot Protection: ASTM F-2412 and F-2413**

The employer shall ensure that each affected employee uses protective footwear when working in areas where there is a danger of foot injuries due to falling or rolling objects, or objects piercing the sole, or when the use of protective footwear will protect the affected employee from an electrical hazard, such as a static-discharge or electric-shock hazard, that remains after the employer takes other necessary protective measures.

All ANSI- approved footwear has a protective toe and offers impact and compression protection. Check the product's labeling or the manufacturer to ensure the footwear will protect the user from the on-the-job exposure. The University will, at the request of authorized supervisors and department heads, reimburse any employee or faculty member no less than 30 percent of the cost of such shoes. This subsidy must be budgeted in departmental funds and there will be no general fund set up for financing. To meet the demands of normal wear or damage from on-the-job accidents, the subsidy must be made available as often as necessary.

The first line of the marking will indicate ASTM designation (e.g., "ASTM F2413-05")

The second line of the marking indicates specifications concerning the footwear.

- M or F = male or female
- I/(75 or 50) = Impact resistance (75 or 50 foot-pounds)
- C/(75 or 50) = Compression resistance (2500 or 1750 psi)
- Mt/(75 or 50) = Metatarsal Protection (75 or 50 foot-pounds)
- EH = electric shock resistance

Damaged or defective shoes should be replaced. The CAM encourages departments to subsidize the purchase of properly designated safety shoes from departmental funds for their employees.

### **Hand Protection:**

For hand protection, OSHA recommends that PPE selection be based upon the tasks to be performed and the performance and construction characteristics of glove material. There is no standard that provides design or performance characteristics other than chemical and industrial applications. For protection against chemicals, glove selection must be based on the chemicals encountered, the chemical resistance and the physical properties of the glove material. For further assistance, contact the Division of Research Safety.

Gloves must be worn when there is the potential for injury or exposure to skin contact from electrical, chemicals, infectious agents, heat, cold, abrasive, and cutting objects. Appropriate gloves are best selected by referring to glove specifications in laboratory or safety supply catalogs.

- Rubber insulating gloves are among the most important articles of personal protection for electrical workers. To be effective, electrical safety gloves must incorporate dielectric properties and physical strength, along with flexibility and durability. To help ensure safety and performance, they should meet and/or exceed the requirements of the ASTM International ASTM D120-14a – Standard Specification for Rubber Insulating Gloves. Gloves should also be electrically tested following ASTM D120-14a and the International Electrotechnical Commission IEC 60903 standard.
- Chemical resistance information should be verified with each manufacturer since similar materials (e.g., nitrile) available from different manufacturers may vary widely in their performance depending upon the particular manufacturing method and glove design. Not all gloves are equally effective in preventing skin contact, especially from chemical exposures. Chemicals eventually permeate gloves; however, they can be used safely for specific time periods when the conditions of use and glove characteristics (e.g. thickness, permeation, rate and time, are known).
- Disposable gloves can be used for powders and liquids of low toxicity in situations where incidental splashes may occur. They provide good protection against biological material. Should the glove become contaminated, remove it immediately and wash the hands. Disposable gloves have no mechanical resistance, should be changed frequently, and should never be reused.
- There are a wide variety of insulated, thermal cold condition work gloves. From water repellant to thermal insulated, and cut-resistant to freezer ready, there are gloves perfectly suited for your cold condition work environment.
- Heat-resistant gloves are designed to protect workers' hands from burns or other injuries that can result from coming into contact with extremely hot objects, working near sparks or flames, or from being exposed to high temperatures in the workplace. Since the severity of heat hazards can vary from low to extreme depending on the application or industry, certain heat-resistant gloves are better suited to some workplaces over others.
- Cut-resistant gloves are designed to protect hands from direct contact with sharp edges such as glass, metal, ceramics and other materials. Cut resistance is a function of a glove's material composition and thickness. You can increase the level of cut protection by increasing material weight (i.e., ounces per square yard); by using high-performance materials such as Dyneema®, Kevlar®, and metal mesh; or by using composite yarns made with varying combinations of stainless steel, fiberglass, synthetic and high-performance yarns.
- Leather work gloves are capable of standing up to some of your most rigorous tasks. Leather helps protect workers' hands from exposures to cold, heat, abrasion and impact. It also offers dexterity and breathability. These characteristics make leather an ideal choice for work gloves.

Gloves must be cleaned after use and replaced periodically depending upon chemical permeability to the material handled. When gloves become torn or worn through by physical contact they should be replaced.

**Protective Clothing: ASTM F1506**

Personal protective clothing is required where employees may be exposed to such hazards as toxic or corrosive chemicals, biological pathogens, molten metal splashes, thermal extremes, etc. The protective clothing may take the form of aprons, coveralls, coats, pants, hats, hoods, sleeves, vests, gloves, and totally encapsulating chemical protective suits.

Protective clothing shall be of safe design and construction for the work to be performed. The clothing selected should be able to protect the body by preventing injury or impairment through absorption or physical contact. In general, protective clothing should encompass the following guidelines:

- Wool and specially treated cotton clothing are fire-resistant and comfortable.
- Heavy fabrics protect against cuts and bruises from heavy, sharp or rough materials.
- Leather guards against dry heat and flame.
- Rubber protects against acids and chemicals.
- Synthetic materials may catch on fire more easily.
- Disposable suits of paper like material protect against dusty materials.
- Disposable or reusable suits for liquid or vapor protection should be evaluated on a case-by-case basis.
- Defective or damaged clothing should not be used.

Employees within the right-of-way who are exposed to traffic (vehicles using the highway for purposes of travel) or to construction equipment shall wear high-visibility safety apparel. High-visibility clothing is intended to clearly distinguish the worker from the environment.

- ANSI Z89.1 class 2 high-visibility apparel is required as a minimum when working in and around vehicular traffic and construction equipment.
- ANSI Z89.1 class 3 is required for work at night, for work near traffic above 50 mph, and other situations if determined by a Job Hazard Analysis.

Employees working in areas where electrical hazards are present shall be provided with, and shall use, protective equipment that helps to protect the worker from electrical shock and arc flash hazards. All employees that work on or near energized electrical installations shall wear the appropriate PPE.

- Electrical Protective Hoods and Clothing shall also be in conformance with NFPA 70E and 2112.
- The PPE shall be designed and constructed for the specific part of the body to be protected and for the work to be performed.
- Shock protection: The appropriate nonconductive protective PPE shall be selected and used to protect the electrical worker from injury due to electrical shock from live parts. For example, voltage rated gloves are required to protect the hands from possible electric shock while testing an electrical component for the presence of voltage.
- Arc flash protection: The appropriate flame-resistant PPE shall be selected and used to minimize the thermal effects of an electrical arc flash on the electrical worker.

**Document Revisions**

July 9, 2020

Initial version for shared S&amp;C and DRS program document.