University of Illinois at Urbana-Champaign
Facilities & Services
Division of Safety and Compliance

Personal Protective Equipment Program

Last Updated 2014
PURPOSE
The University of Illinois at Urbana-Champaign (UIUC), through the Division of Safety and Compliance (S&C), has established the Personal Protective Equipment (PPE) Program to protect the health and safety of university employees (based on Occupational Safety and Health Administration (OSHA) 29 CFR 1910.95 and 1926.52, and the Illinois Department of Labor (IDOL), which has adopted the OSHA regulations).

POLICY
It is the policy of UIUC to provide its employees with a safe and healthful working environment. This is accomplished as far as feasible with accepted engineering controls 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.

SCOPE
The Personal Protective Equipment (PPE) Program provides the University community with information necessary to identify work situations that require the use of PPE, to properly select and use PPE, and to establish the means for documentation of this information in department-specific policies.

PPE devices are not to be relied on as the only means to provide protection 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 UIUC policies and procedures involving the protection of workers in the work place.

REFERENCE REGULATIONS
Personal Protective Equipment Standards
- University of Illinois Campus Administrative Manual: Policy on the Use of Personal Protective Equipment
RESPONSIBILITIES
The UIUC Division of Safety and Compliance shall:
1. Develop a written PPE program and review it on an annual basis.
2. Conduct hazard assessments upon request and as needed to assure adequate protection of employees.
3. Assist supervisors in the selection of appropriate PPE and provide recommendations for appropriate engineering controls.
4. Provide or arrange for training on PPE for supervisors and employees.
5. Wear appropriate PPE when visiting job sites as dictated by job hazard assessments.

Deans, Directors and Department Heads shall:
1. Demonstrate a commitment, both fiscal and managerial, towards the implementation of the PPE Program.
2. Establish budget support for this program for individual departments.
3. Ensure the Personal Protective Equipment Selection Guidelines are implemented and maintained within the department.
4. Wear appropriate PPE when visiting job sites as dictated by job hazard assessments.

Supervisors of employees who may require personal protective equipment shall:
1. Contact S&C with questions about the type of PPE required for a task.
2. Ensure employees attend training on the proper selection, storage, use and maintenance of personal protective equipment when employees they supervise are required to use such equipment.
3. Ensure retraining if:
   a. Changes in the workplace render previous training obsolete
   b. Changes in the types of personal protective equipment to be used render previous training obsolete
   c. Inadequacies in an affected employee’s knowledge or use of assigned personal protective equipment indicate that the employee has not retained the requisite understanding or skill.
4. Document and maintain training records.
5. Conduct or arrange for the appropriate selection and fitting of PPE.
6. Supply the appropriate PPE to employees and ensure it is worn according to the training provided.
7. Wear appropriate PPE when visiting job sites as dictated by job hazard assessments.
8. Assure that the requirements of this program are observed with respect to hazard surveys, testing, training and record keeping.

Employees shall:
1. Report to the supervisor any operation or job for which they suspect that PPE may be needed.
2. Attend training on the PPE as required by this program.
3. Use PPE in accordance with instruction and training received as necessitated by job hazard assessments.
4. Not use any PPE with deficiencies and report any deficiencies or malfunctions to a supervisor.
5. Notify the supervisor of a noticeable change in health, or potential problem with the PPE.
6. Conduct assigned tasks in a safe manner.
ADOPTIONS BY REFERENCE
Consult these programs as necessary to insure adequate protection is maintained.

1. Procedures and requirements for obtaining safety shoes are outlined in the University of Illinois Safety Shoe Plan.
2. Procedures and requirements for obtaining prescription safety eyeglasses are outlined in the University of Illinois Eye Protection Plan.
3. Procedures and requirements for respiratory protection are addressed in the University of Illinois Respiratory Protection Program.
4. Procedures and requirements for hearing protection are addressed in the University of Illinois Hearing Conservation Program.
5. Procedures and requirements for fall protection are addressed in the University of Illinois Elevated Work Program.
6. Procedures and requirements for electrical safety equipment are addressed in the University of Illinois Electrical Safety Program.
7. Other University or Plant Operations programs may contain additional guidance for selection and use of PPE for specific situations or tasks.

HAZARD ASSESSMENTS
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 and a comprehensive hazard assessment includes the identification of hazards in both categories. 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 workplace should be periodically reassessed for any changes in conditions, equipment or operating procedures that could affect occupational hazards. This periodic reassessment should also include a review of injury and illness records to spot any trends or areas of concern and taking appropriate corrective action. The suitability of existing PPE, including an evaluation of its condition and age, should be included in the reassessment.

The hazard assessment may be conducted on an individual employee, performing a single task, or a group of employees if all the employees perform an identical task. The assessment should include direct observation and conclude in written documentation.
Hazard Assessment Documentation
The Job Hazard Assessment Form (Appendix B) certifies that the assessment process has been completed as required by regulations. This assessment assures that potential workplace hazards necessitating PPE use have been identified and the PPE selected is appropriate for those hazards and the affected employees. Where hazards are present, affected employees must be informed concerning PPE selection decisions. Supervisors are responsible for ensuring that hazard assessments are performed and documented. Completed assessment forms should be maintained within the department.
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 selected PPE

Hazard Assessment Implementation
Persons working in or near hazard areas will refer to hazard assessment documentation for PPE requirements specific to that jobsite and don the appropriate PPE. When entering a jobsite, observers/supervisors should also wear the PPE indicated for that location/job/task appropriate to the level of involvement at the job site.

PPE SELECTION GUIDELINES
The workplace should be periodically reassessed for any changes in conditions, equipment or operating procedures that could affect occupational hazards. This periodic reassessment should also include a review of injury and illness records to spot any trends or areas of concern and take appropriate corrective action. The suitability of existing PPE, including an evaluation of its condition and age, should be included in the reassessment.

For each hazard identified, personal protective equipment must be selected that will protect the employee by creating a barrier against identified hazards. Personal protective equipment must be selected to protect against any hazard that is present or likely to be present. Department personnel should become familiar with the potential hazards, the type of protective equipment that is available, and the level of protection that is provided by that equipment. The PPE Worksheet will assist in this process (Appendix C).

The personal protective equipment selected must fit the employee it is intended to protect; employees should have the correct size of protective equipment. Whenever possible, adjustable personal protective equipment should be procured. Personal protective equipment that fits properly and is comfortable will more likely be worn by employees. 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.

PPE in the categories listed below must meet current cited American National Standards Institute (ANSI) standards. Existing PPE stocks must meet the ANSI standard in effect at the time of its manufacture or provide protection equivalent to PPE manufactured according to ANSI criteria. OSHA requires PPE to meet the following ANSI standards.


For hand protection, there is no ANSI standard for gloves but OSHA recommends that selection be based upon the tasks to be performed and the performance and construction characteristics of the glove material. For protection against chemicals, glove selection must be based on the chemicals encountered, the chemical resistance and the physical properties of the glove material.

Temporary Traffic Barriers (TTB)

All workers, including emergency responders, within the right-of-way who are exposed either to traffic (vehicles using the highway for purposes of travel) or to work vehicles and construction equipment within the TTB zone shall wear high-visibility safety apparel. High-visibility clothing is intended to clearly distinguish the worker from the environment. The basic high-visibility garment includes three components: background material, retro-reflective material (bands), and combined-performance material (a combination of retro-reflective and fluorescent material that may separate the two).

The ANSI standards determine the material criteria by which PPE is manufactured. For guidance on selection of the proper PPE for a particular application, use published selection references, such as the National Institute for Occupational Safety and Health (NIOSH) selection guides found at: http://www.cdc.gov/niosh/ppe/

TTB zones must follow additional safety precautions outlined in the Manual on Uniform Traffic Control Devices and the lane closure process found at: http://www.fs.illinois.edu/services/more-services/tdm/closures. Contact F&S Transportation Demand Management for additional information on lane closures.

TRAINING

Training must be provided for employees who are required to wear PPE. Retraining must also be provided when there is reason to believe that any previously trained employee does not have the understanding and skill to use PPE properly. Circumstances where such retraining is required include 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. Online general PPE training is provided through S&C for all employees who wear PPE. Site specific PPE training will be conducted by department trainers and documented with the PPE Training Documentation Form.

On-line training will include:

• When and why personal protective equipment is necessary;
• What type of personal protective equipment is necessary;
• 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.

Trainees will have the opportunity to ask questions and receive responses from a qualified trainer via email generated through the online learning environment.
Site-specific training will include:

- What type of personal protective equipment is necessary for each job;
- How properly to don, doff, adjust and wear personal protective equipment;
- Limitations of the PPE, especially within the parameters of the particular site;
- Proper care, maintenance, useful life, and disposal of the PPE; and
- How to obtain PPE.

Each employee should 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
Departments should document that employees have received and understood 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 of the PPE Training Documentation Form fulfills this requirement (Appendix C). 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.

WOMEN IN CONSTRUCTION
While the hazards involved in construction work are well known, female construction workers face unique challenges. To increase awareness of these issues, OSHA signed an alliance with the National Association of Women in Construction (NAWIC). The alliance develops targeted training resources and other informational materials to help construction employers ensure the safety of their female employees. See Appendix E for more information.

ERGONOMIC HAND TOOLS
Ergonomic hand tools can reduce the risk of injuries. For more information on desirable features of ergonomic hand tools, see Appendix F.

OSHA 29 CODE OF FEDERAL REGULATIONS (CFR)
OSHA provides standards that apply to PPE. For a review of specific standards, see Appendix G.
The Hazard Assessment
The hazard assessment should begin with a walk-through survey of the facility to develop a list of potential hazards in the following basic hazard categories.

- Impact
- Penetration
- Compression (roll-over)
- Chemical
- Heat/cold
- Harmful dust
- Light (optical) radiation
- Biologic

In addition to noting the basic layout of the facility and reviewing any history of occupational illnesses or injuries, things to look for during the walk-through survey include the following.

- 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
- Biologic hazards such as blood or other potentially infected material
# Job Hazard Assessment Form

<table>
<thead>
<tr>
<th>Task:</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
</table>

## Training Requirements:
1. |

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Basic Job Steps</strong></td>
<td><strong>Potential Hazards</strong></td>
<td><strong>Hazard Control</strong></td>
<td><strong>PPE Requirements</strong></td>
</tr>
<tr>
<td>What is done</td>
<td>Potential for injury/illness</td>
<td>Safe procedures to avoid hazards</td>
<td>See PPE Worksheet for assistance</td>
</tr>
</tbody>
</table>

---

*Last updated by: DGillon*

*Last Updated: Oct 2014*

*University of Illinois at Urbana-Champaign*

*http://www.fs.illinois.edu/services/safety-and-compliance*

*217-265-9828*
# PPE Worksheet

<table>
<thead>
<tr>
<th>Job Title:</th>
<th>Unit/Dept:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Job Location:</td>
<td></td>
</tr>
<tr>
<td>Workplace/Task Assessed:</td>
<td></td>
</tr>
<tr>
<td>Date(s):</td>
<td>Hazards Assessed By:</td>
</tr>
</tbody>
</table>

## Eye Hazards?

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
<th>REQUIRED PPE - EYES</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Frontal &amp; side impact</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Electrical arc</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Molten metal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chemical splash</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Injurious light/heat radiation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Suspended particles</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Extreme hot/cold splash</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Other:</td>
</tr>
<tr>
<td></td>
<td>Other:</td>
<td></td>
</tr>
</tbody>
</table>

**Required Eye PPE might include glasses, goggles, laser safety glasses, welding shields, helmets, etc.**

## Face Hazards?

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
<th>REQUIRED PPE - FACE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Projectile impact</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chemical splash</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hot/cold splash</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Electrical arc</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Injurious heat radiation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Other:</td>
</tr>
<tr>
<td></td>
<td>Other:</td>
<td></td>
</tr>
</tbody>
</table>

**Required Face PPE might include face shields, helmets, etc.**

## Foot Hazards?

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
<th>REQUIRED PPE - FOOT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Falling objects</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rolling objects</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Electrical contact</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sole puncture</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Slippery surface</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Other:</td>
</tr>
<tr>
<td></td>
<td>Other:</td>
<td></td>
</tr>
</tbody>
</table>

**Required Eye PPE might include safety footwear, etc.**

## Hand Hazards?

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
<th>REQUIRED PPE - HAND</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Barrier</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bump contact</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chemical burns</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Electrical contact</td>
</tr>
</tbody>
</table>

---

*Last updated by: DGillon*

*University of Illinois at Urbana-Champaign*

*http://www.fs.illinois.edu/services/safety-and-compliance*

*217-265-9828*
### Extreme heat/cold

- Blood/Infectious material
- Electricity
- Other:
- Other:

**Required Hand PPE** might include gloves (various types), protective sleeves, long-sleeved shirts, etc.

### RESPIRATORY HAZARDS?

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dust or particulate</td>
<td></td>
</tr>
<tr>
<td>Toxic gas/vapor</td>
<td></td>
</tr>
<tr>
<td>Pesticides</td>
<td></td>
</tr>
<tr>
<td>Other:</td>
<td></td>
</tr>
<tr>
<td>Other:</td>
<td></td>
</tr>
</tbody>
</table>

Required Respiratory PPE might include dust mask, ½ mask, full mask, PAPR, SCBA, etc.

### HEAD HAZARDS?

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overhead beams</td>
<td></td>
</tr>
<tr>
<td>Overhead pipes</td>
<td></td>
</tr>
<tr>
<td>Insulating blanket</td>
<td></td>
</tr>
<tr>
<td>Exposed electricals</td>
<td></td>
</tr>
<tr>
<td>Falling objects</td>
<td></td>
</tr>
<tr>
<td>Machine parts</td>
<td></td>
</tr>
<tr>
<td>Other:</td>
<td></td>
</tr>
<tr>
<td>Other:</td>
<td></td>
</tr>
</tbody>
</table>

Required Head PPE might include protective helmets (various types), etc.

### HEARING HAZARDS?

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loud noises/environment</td>
<td></td>
</tr>
<tr>
<td>Noisy machines/tools</td>
<td></td>
</tr>
<tr>
<td>Landscaping equipment</td>
<td></td>
</tr>
<tr>
<td>Other:</td>
<td></td>
</tr>
<tr>
<td>Other:</td>
<td></td>
</tr>
</tbody>
</table>

Required Hearing PPE might include ear plugs, ear muffs, etc.

### OTHER HAZARDS?

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermal burns</td>
<td></td>
</tr>
<tr>
<td>Extreme heat/cold</td>
<td></td>
</tr>
<tr>
<td>Height on scaffolding</td>
<td></td>
</tr>
<tr>
<td>Traffic control</td>
<td></td>
</tr>
</tbody>
</table>

Required Other Hazards PPE might include flame retardant clothing, high visibility clothing, fall arrest equipment, etc.
## PPE Training Documentation Form

<table>
<thead>
<tr>
<th>PPE Covered:</th>
<th>Date:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Job Title:</th>
<th>Unit/Dept:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Trainer(s):</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

I certify that these individuals have understood and demonstrated the following: when PPE is necessary; what PPE is necessary; how to properly don, doff, adjust and wear the PPE; limitations of the PPE; and how to properly care for, maintain, and dispose of the PPE.

**Signature of Trainer:**

<table>
<thead>
<tr>
<th>Name</th>
<th>Employee #</th>
<th>Signature</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Last updated by: DGillon  Page 13 of 19  Last Updated: Oct 2014
Women in Construction

While the hazards involved in construction work are well known, female construction workers face unique challenges. To increase awareness of these issues, OSHA signed an alliance with the National Association of Women in Construction (NAWIC). The alliance develops targeted training resources and other informational materials to help construction employers ensure the safety of their female employees.

The materials will focus primarily on three issues:

Sanitation. Many construction sites use temporary restrooms, which are often not well maintained. As a result, women often avoid using these facilities and drinking water on the job. This can lead to heat stress and other health problems, including bladder and kidney infections.

OSHA recommends the following solutions:
- Provide separate bathrooms for male and female workers.
- Make sure hand sanitizer is available.
- Make sure sanitary facilities are cleaned regularly.
- If work is performed at night, bathroom facilities should be located in well-lit areas.

Poorly fitting personal protective equipment. Wearing PPE is essential for safety in most construction environments. However, women often have difficulty finding PPE that fits them properly due to their usually smaller size and different body proportions.

For example, compared to men, women typically have shorter and narrower feet, narrower shoulders, wider hips, smaller hands, and a smaller head and face circumference. All of these differences affect the comfort and fit of PPE, and simply scaling PPE designed for men down in size often doesn’t solve the problem.

PPE that doesn’t fit properly does not perform effectively, leaving female workers exposed to the hazards the PPE is designed to protect against. And if PPE is uncomfortable or poorly fitting, women may avoid wearing it altogether. Equipment marketed as “one-size-fits-all” is often particularly problematic.

OSHA recommends the following steps to make sure PPE protects female employees effectively:
- Purchase PPE in a wide range of sizes, including those suitable for women.
- Maintain a directory of PPE manufacturers and suppliers and the sizes they offer. The International Safety Equipment Association (ISAE) provides a list of companies and suppliers that offer female-specific PPE at [http://tinyurl.com/q82lxpm](http://tinyurl.com/q82lxpm).
- Give female employees the chance to test PPE before use to make sure it fits properly, protects against hazards, and will not interfere with job functions.

Musculoskeletal hazards. Like PPE, tools are often designed to be used by average-sized men. Because women typically have less upper body strength, the extra force required to operate certain tools or perform certain tasks, such as lifting, may put them at increased risk for ergonomic injuries.

Possible solutions include the following:
• Determine whether alternative methods for performing certain strength-intensive tasks are feasible, and communicate these methods to all employees during training.
• Train all workers on proper lifting and bending methods.
• When possible, purchase equipment and tools designed with ergonomic considerations in mind. If female (or male) workers complain that tools are difficult and/or painful to use, check to see if an ergonomically designed alternative is available.

OSHA has additional information about women in construction on a webpage created specifically for the alliance. Check it out at https://www.osha.gov/doc/topics/women/index.html.
Ergonomic Hand Tools

Ergonomic hand tools can reduce the risk of injury by:

1. Reducing the amount of grip force required to operate a tool and perform a particular task
2. Making it possible to perform a task while maintaining neutral, comfortable postures of the wrist, elbow, or other joints
3. Reducing contact stress from tools that may 'dig' into hands by eliminating sharp edges, finger grooves, or excessively short handles.

Desirable hand tool features that make the tool more ergonomic:

- **Handle Material**
  - non-slip, soft material
  - a sleeve can be used to cover hard handles, but be cautious because a sleeve adds to diameter and/or grip span of the tool (see below for diameter/grip span recommendations)
  - make sure the sleeve fits snugly so that the tool doesn’t slip out of the sleeve while someone is working.

- **Operating mechanism**
  - Select spring-loaded handles that automatically return to an open position for pinching, gripping or cutting tools.
  - Clamps, grips, or locking pliers can be used for tasks that require continuous application of force

- **Handle diameter for single-handed tools, such as a screwdriver**
  - Between 1.25 and 2 inches for power tasks (high force)
  - Between 0.25 and .5 inches for precision tasks (low force)

- **Grip span for double-handled tools, such as pliers**
  - For power tasks (high force)
    - Closed grip span at least 2.0
    - Open grip span less than 3.5
  - Spring loaded handles are preferred
  - For precision tasks (low force)
    - Closed grip span at least 1.0
    - Open grip span less than 3.0
      - spring-loaded handles are preferred
    - Handle length - longer than the worker's hand width
    - Handle shape –
      - Avoid finger grooves and sharp edges
      - Select a handle that helps to keep the wrist straight
        - For horizontal forearm motions a bend handle works well
        - For vertical movements a straight handle is usually the best choice.


**What Should Not be Worn**

Rings, wristwatches, earrings, bracelets, and other jewelry must not be worn if it's possible for it to come into contact with power driven machinery or electric circuitry.
OSHA 29 CFR

OSHA 29 CFR 1910.134 (a) (2)

RESPIRATORY PROTECTION

“Respirators shall be provided by the employer when such equipment is necessary to protect the health of the employee. The employer shall provide the respirators that are applicable and suitable for the purpose intended”

Respiratory Protection may be used to protect against inhalation hazards when engineering and administrative controls are not feasible or adequate. See the Respiratory Protection Program for further information.

OSHA 29 CFR 1919.133 (a)

EYE AND FACE PROTECTION

“Protective eye and face equipment shall be required where there is a reasonable probability of injury that can be prevented by such equipment. In such cases, employers shall make conveniently available a type of protector suitable for the work to be performed, and employees shall use such protectors. Suitable eye protectors shall be provided where machines or operations present the hazard of flying objects, glare, liquids, injurious radiation, or a combination of these hazards.”

Side shields are required when there is an impact hazard from flying objects or a chemical splash hazard present. Safety glasses and goggles can protect against impact hazards. Protective eyewear and face wear should be adjusted to provide maximum protection to the areas being protected. Eyeglasses should be worn close to the face to minimize gaps that would allow foreign materials to enter the eye. Eye and face protection should be kept clean based on recommendations from the manufacturer. When the protection becomes scratched or damaged, it should be replaced. Pits or scratches may affect the impact resistance. Employees should inspect eye and face protection before wearing and replace any defective equipment.

OSHA 29 CFR 1910.95 (d) (i)

HEARING PROTECTION

“When information indicates that any employee's exposure may equal or exceed an 8-hour time-weighted average of 85 decibels, the employer shall develop and implement a monitoring program.

The sampling strategy shall be designed to identify employees for inclusion in the hearing conservation program and to enable the proper selection of hearing protectors.”

Continued exposure to noise of sufficient intensity can result in permanent hearing impairment. If an individual must shout to communicate with another close by because of noise, it is likely that the level of this noise is of a sufficient amplitude to cause a temporary or permanent hearing loss (threshold shift). For exposures of 85 dBA or greater, controls must be instituted to lower the noise levels to below 85 dBA TWA for an eight-hour day. If controls cannot be instituted to accomplish this reduction, hearing protection must be worn which will reduce the exposures to an acceptable level until the noise can be reduced. Occupation Safety and Health can provide a noise level assessment, calculate eight-hour exposure levels and make recommendations for PPE.
OSHA 29 CFR 1910.335(a)(1)(i)
ELECTRICAL SAFETY
Employees working in areas where there are potential electrical hazards shall be provided with, and shall use, electrical protective equipment that is appropriate for the specific parts of the body to be protected and for the work to be performed. The flame resistant or flame-retardant-treated properties of apparel can be compromised if the garment is incorrectly laundered or repaired and, in any case, will diminish to the point of ineffectiveness after many washings. Appropriate laundering is essential—see garment labels for more information.

OSHA 29 CFR Guidelines
Head protection
Head protection is available to protect the head from falling objects (impact and penetration), electrical hazards, and bump hazards. Protective helmets are required where falling object hazards are present. Hair enclosures are required for long hair (longer than four inches), which can be drawn into machine parts such as chains, belts rotating devices, suction devices, and blowers. Hair may even be drawn into machines guarded with mesh. It may also present an ignition risk in areas near open flames or welding. Employees with long hair must cover and protect their hair with a hat, cap, net, or bandana. These items must fit so as to not present a hazard either with machinery, ignition sources, or interference with other PPE.

The shell is the rigid part of the hat and the suspension is the inner portion that cradles the head. Never apply paints or solvents to the helmet; it could damage the strength and dielectric properties. Inspect the shell and the suspension before each use. Look for cracks, chips, dents, or deterioration or any other signs that would indicate the need to replace the shell immediately. Look for cracks, tears or broken straps in the suspension and replace as necessary.

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.

Foot protection
Foot protection is necessary when hazards exist that could result in impact and compression, electrical, conductive, or metatarsal injuries. Keep protective footwear clean and polished, they will last longer. Replace broken or frayed laces.
Be attentive to the wear and tear on the entire shoe or boot.
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

OSHA indicates: The employer is not required to pay for non-specialty safety-toe protective footwear (including steel-toe shoes or steel-toe boots) provided that the employer permits such items to be worn off the job-site. 29 CFR 1910.132(h)(2)

The CAM encourages departments to subsidize the purchase of safety shoes for their employees at no less than 30% of the cost of such shoes (approximately $40). http://www.cam.illinois.edu/v/archive/v-b-6.3To20110815.htm

Hand protection

Hand protection is available to protect against cut/punctures, abrasions, thermal burns, vibration, chemical exposures, and electrical shock. There is not a single glove that will protect from all hazards. Selection of gloves must be based on the hazards that are present, the job task, work conditions, and the duration of use. Gloves that are torn or damaged should not be used. Assure that the glove will provide adequate protection for the chemical to be encountered. If multiple chemical hazards exist, base the effectiveness of the glove on the chemical with the fastest breakthrough time. Inspect gloves prior to each use. If gloves are to be reused, follow the manufacturer’s instructions for proper decontamination and storage. It is important to note the expected service life of the glove as well, to plan for expected disposal times.