AGENDA

DATE: October 24, 2019

TO: Safety Committee Members

RE: SAFETY COMMITTEE MEETING

A meeting of the Safety Committee will be held on Tuesday, October 29, 2019 at 1:30P.M. in the Second Floor Conference Room 214 at Marinette City Hall, 1905 Hall Avenue, Marinette, Wisconsin.

1. Roll call.

2. Approval of Minutes from the 12/13/18 meeting.

3. Discuss training city employees and city council members for critical incident / active shooter response (Chief Mabry).

4. Discuss Personal Protection Equipment (PPE) and Personal Protection Policy (PPP) (Mayor Genisot) - (See attached)

5. Discuss if the City has an emergency plan. If so, can it be distributed to employees? (Melinda Campbell)

6. Future Agenda Items

7. Adjourn.

CC: Mayor Steve Genisot (w/encl.); City Attorney, Jonathan Sbar (w/encl.); City Clerk, Lana Bero (w/encl.); Common Council Members; Department Heads; Bay Cities Radio (w/encl.); EagleHerald (w/encl.); Peshtigo Times (w/encl.); City Hall Bulletin Board.
Marinette County provides equipment and training for each employee who is required to use Personal Protective Equipment (PPE) when performing hazardous job duties. It is the responsibility of the employee to utilize PPE when necessary.

**EYE PROTECTION**

All employees are provided with eye and face protection when machines or operations present potential eye or face injury from physical, chemical or radiation agents. The main cause of job related eye injury results from objects striking a worker’s eye. Contact with chemicals also accounts for a large group of injuries. Other causes of injury to the eye are tools and swinging objects like ropes and chains striking worker’s eyes. The majority of workers who have had eye injuries were not wearing the proper eye protection or no eye protection at all. Most felt that eye protection was not needed.

Most eye injuries can be avoided by following safety precautions and wearing proper protective equipment. Some of the reported causes of eye injuries are:

- Hazardous gases, vapors and liquids
- Dusts or powders, fumes and mists
- Flying objects or particles
- Splashing metals
- Thermal and radiation hazards such as heat, glare, ultraviolet and infrared rays
- Lasers
- Electrical Hazards

The first 15 seconds after the eye injury occurs is the critical period. Eyewash should be located within 100 feet or a ten second walk from the workstation. Know where these stations are located.

If an employee requires corrective lenses, he/she can safely wear contact lenses on the job. Remember - contacts should be removed immediately if redness of the eye, blurring of vision or pain develops on the job. It is also a good idea to have a spare pair of contacts or prescription glasses with you. Situations where contacts should be worn with caution include workplaces where you might be exposed to chemical fumes, vapors or splashes, intense heat and molten metals.

The following is a list of safety equipment that is available to keep your eyes safe from injury:

**Safety Glasses**

The most common type of protective equipment for the eyes is safety glasses. They may look like normal street-wear glasses, but they are made of glass, plastic or polycarbonate. They are much stronger than street-wear or corrective lenses, are impact resistant and come in prescription or non-prescription forms.

Safety frames are stronger than corrective lenses and are heat-resistant. They also help prevent lenses from being pushed into your eyes.

Safety glasses also are available with side shield guards. Semi-side shields provide protection for the sides of your eyes. Eyecup side shields provide more thorough eye protection from hazards that come from the front, side, top or bottom.

**Goggles**

Goggles are very similar to safety glasses, but fit closer to the eyes. They can provide additional protection in hazardous situations involving liquid splashes, fumes, vapors and dust. Some models can be worn over prescription glasses and others are made with fabric eyecups to provide better ventilation.

**Face Shields**

Full-face protection is required to protect against molten metal and chemical splashes. Face shields are available to fit over a hard hat or to wear directly on the head. A face shield should always be used with other eye protection such as goggles or glasses.
REMEMBER - You must wear protective eyewear when working around hazardous work conditions. You only have one pair of eyes and one chance to protect them. Face and eye protection equipment should be kept clean and in good condition at all times. If you find that a piece of equipment is not in good working condition, turn it in to your supervisor and a replacement will be provided.

HEARING PROTECTION

Noise, or unwanted sound, is one of the most pervasive occupational health problems. Approximately 30 million people in the U.S. are occupationally exposed to hazardous noise. About 10 million people have noise-induced hearing loss, nearly all of which were caused by occupational exposures. Fortunately, the incidence of noise-induced hearing loss can be reduced, or often eliminated, through the successful application of engineering controls and hearing conservation programs.

Anytime a job involves loud noise, earplugs or earmuffs must be worn. It only takes a second to damage the eardrum that causes permanent hearing loss. Always wear protective earplugs or earmuffs when working with loud equipment or in a noisy environment.

Exposure to high noise levels can cause irreversible hearing loss or impairment. It can also create physical and psychological stress.

Waxed cotton, foam or fiberglass wool earplugs are self-forming. Disposable earplugs should be used once and thrown away; non-disposable earplugs should be cleaned after each use for proper maintenance.

HEAD PROTECTION

Head injuries are caused by falling or flying objects, or by bumping the head against a fixed object. Head protection, in the form of protective hats, must do two things -- resist penetration and absorb the shock of the blow. This is accomplished by making the shell of the hat from a material hard enough to resist the blow and by utilizing a shock-absorbing lining composed of headband and crown straps to keep the shell away from the wearer's skull. Protective hats are also used to protect against electric shock.

Employees must wear protective helmets when working in areas where there is a potential for injury to the head from falling objects. Protective helmets designed to reduce electrical shock hazard must be worn by each affected employee when he/she is near an exposed electrical conductor which could contact the head.

Protective helmets for head protection against impact blows must withstand penetration and absorb the shock of a blow. In some cases, helmets should also protect against electric shock. The American National Standards Institute (ANSI) has established recognized standards for helmets.

Materials used in helmets should be water-resistant and slow burning. Each helmet consists essentially of a shell and suspension. Ventilation is provided by a space between the headband and the shell. Each helmet should be accompanied by the instructions explaining the proper method of adjusting and replacing the suspension and headband.

FOOT PROTECTION

For protection against the falling/rolling objects, sharp objects, molten metal, hot surfaces or wet/slipspery surfaces, workers should use appropriate foot guards, safety shoes or boots/leggings while working in conditions that require such protection. Safety shoes/boots should be sturdy and have an impact-resistant toe. Shoes/boots must meet ANSI standards. Employees must wear 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 and where the employee’s feet are exposed to electrical hazards.

HAND PROTECTION

Employees must use appropriate hand protection when hands are exposed to hazards. Examples of hazards are skin absorption of harmful substances, severe cuts or lacerations, severe abrasions, punctures, chemical burns, thermal burns and harmful temperature extremes.

Burns, cuts, electrical shock, amputation and absorption of chemicals are examples of hazards associated with arm and hand injuries. A wide assortment of gloves, hand pads, sleeves and wrislets for protection from these hazards is

Personal Protective Equipment

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available. The devices should be selected to fit the specific task. Rubber is considered the best material for insulating gloves and sleeves and must conform to ANSI standards.

TORSO PROTECTION

Many hazards can threaten the torso - heat, splashes from hot metals/liquids, impacts, cuts, acids and radiation. A variety of protective clothing is available - vests, jackets, aprons, coveralls and full body suits. Specially treated wool and cotton are two natural fibers that are fire-resistant and comfortable since they adapt well to changing workplace temperatures. Duck, a closely woven cotton fabric, is good for light-duty protective clothing. It can protect against cuts and bruises on jobs where employees handle heavy, sharp or rough material. Heat-resistant material such as leather is often used in protective clothing to guard against dry heat and flame. Rubber and rubberized fabrics, neoprene and plastics give protection against some acids and chemicals.

It is important to refer to the manufacturers' selection guides for the effectiveness of specific materials against specific chemicals. Disposable suits of plastic-like or other similar synthetic materials are particularly important for protection from dusty materials or materials that can splash. If the substance is extremely toxic, a completely enclosed chemical suit may be necessary. The clothing should be inspected to ensure proper fit and function for continued protection.

All employees exposed to either traffic (vehicles using the highway for purposes of travel) or to construction equipment within the work area shall wear approved high-visibility safety apparel.

CONCLUSION

Personal protective equipment can be effective only if the equipment is selected based on its intended use; employees are trained in its use; and the equipment is properly tested, maintained and worn. In the final analysis, the best protection comes from educated employees committed to sound work practices. It's often a matter of life and death.
1. The first fifteen seconds after the eye injury occurs is the critical period.
   True  False

2. Specially treated cotton and wool are two natural fibers that are fire-resistant.
   True  False

3. If an employee requires corrective lenses or wears prescription eyeglasses, safety glasses are never required.
   True  False

4. Rubber is considered the best material for insulating gloves and sleeves and must conform to ANSI standards.
   True  False

5. Disposable earplugs should be cleaned after each use for proper maintenance.
   True  False

6. PPE must be selected based on its intended use.
   True  False

7. List three of the seven listed causes of eye injuries.

   __________________________________________

   __________________________________________

   __________________________________________

8. It is not necessary to wear another form of eye protection when wearing a face shield.
   True  False

9. It is the responsibility of the employee to use proper personal protective equipment while performing hazardous work.
   True  False

10. Employees must wear protective footwear when working in areas where there is a danger of foot injuries due to falling/rolling objects or objects piercing the sole.
    True  False

Date:  _____/_____/_____

Employee Name (Print): ____________________________

Employee Signature: ____________________________

Supervisor Signature: ____________________________
Sample PPE Policies

INSTRUCTIONS

The following sample policies are OPTIONAL. They are not required by WISHA safety and health rules, but they may be useful in helping you develop, establish, and implement your company's PPE requirements and rules. We encourage employers to copy, expand, and modify the sample as necessary to accomplish this.

In addition, the Consultation Section of the Department of Labor and Industries may be called on for assistance at any time. A list of regional service location branches are listed in the resource pages at the end of the guide; contact your local branch for further information or help.

You can also call the toll-free number: 1-800-423-7233.

PLEASE CUSTOMIZE THE FOLLOWING PERSONAL PROTECTIVE EQUIPMENT (PPE) POLICIES ACCORDING TO YOUR WORK PLACE. ADD AND/OR DELETE INFORMATION AS NEEDED TO MAKE IT FIT THE SPECIFIC NEEDS OF YOUR WORK PLACE OPERATIONS AND PROCEDURES.

REMEMBER: YOUR SAFETY AND HEALTH PROGRAM CAN ONLY BE EFFECTIVE IF IT IS PUT INTO PRACTICE!
Personal Protective Equipment Policies

(Customize by adding the name of your business)

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Introduction

The purpose of the Personal Protective Equipment Policies is to protect the employees of (Name of your business) from exposure to work place hazards and the risk of injury through the use of personal protective equipment (PPE). PPE is not a substitute for more effective control methods and its use will be considered only when other means of protection against hazards are not adequate or feasible. It will be used in conjunction with other controls unless no other means of hazard control exist.

Personal protective equipment will be provided, used, and maintained when it has been determined that its use is required to ensure the safety and health of our employees and that such use will lessen the likelihood of occupational injury and/or illness.

This section addresses general PPE requirements, including eye and face, head, foot and leg, hand and arm, body (torso) protection, and protection from drowning. Separate programs exist for respiratory protection and hearing protection as the need for participation in these programs is established through industrial hygiene monitoring. (List other programs or policies requiring PPE, such as Hearing Protection, Respiratory Protection, Fall Protection, etc., that you may have at your work place) are also addressed in (State the section or location in your Accident Prevention Program where they are found).

The (Name of your business) Personal Protective Equipment Policies includes:

- Responsibilities of supervisors and employees
- Hazard assessment and PPE selection
- Employee training
- Cleaning and Maintenance of PPE
Responsibilities

(Customize this page by modifying or adding any additional responsibilities and deleting those that may not apply to your company.)

Safety Person (or designated person responsible for your workplace safety and health program.)

Note: Depending on your business and the number of employees you have, you may simply have a “designated safety person” (who may be a supervisor/lead worker) or a larger organized safety and health unit. Customize this section to fit the needs of your p

(Safety Person or designated person) is responsible for the development, implementation, and administration of (Name of your business)’s PPE policies. This involves

1. Conducting workplace hazard assessments to determine the presence of hazards which necessitate the use of PPE.
2. Selecting and purchasing PPE.
3. Reviewing, updating, and conducting PPE hazard assessments whenever
   • a job changes
   • new equipment is used
   • there has been an accident
   • a supervisor or employee requests it
   • or at least every year
4. Maintaining records on hazard assessments.
5. Maintaining records on PPE assignments and training.
6. Providing training, guidance, and assistance to supervisors and employees on the proper use, care, and cleaning of approved PPE.
7. Periodically re-evaluating the suitability of previously selected PPE.
8. Reviewing, updating, and evaluating the overall effectiveness of PPE use, training, and policies.
SAMPLE PPE POLICIES

Supervisors (leads, etc., and/or designated persons)

Supervisors (leads, etc., and/or designated persons) have the primary responsibility for implementing and enforcing PPE use and policies in their work area. This involves

9. Providing appropriate PPE and making it available to employees.

10. Ensuring that employees are trained on the proper use, care, and cleaning of PPE.

11. Ensuring that PPE training certification and evaluation forms are signed and given to (Safety Person or designated person responsible for your work place safety and health program).

12. Ensuring that employees properly use and maintain their PPE, and follow (Name of your business) PPE policies and rules.

13. Notifying (Name of your business) management and the Safety Person when new hazards are introduced or when processes are added or changed.

14. Ensuring that defective or damaged PPE is immediately disposed of and replaced.

Employees

The PPE user is responsible for following the requirements of the PPE policies. This involves

15. Properly wearing PPE as required.

16. Attending required training sessions.

17. Properly caring for, cleaning, maintaining, and inspecting PPE as required.

18. Following (Name of your business) PPE policies and rules.

19. Informing the supervisor of the need to repair or replace PPE.

Employees who repeatedly disregard and do not follow PPE policies and rules will be (Write in the actions management will take concerning this matter.)

(Customize this page by modifying or adding any additional responsibilities and deleting those that may not apply to your company.)

Sample Policies-4
SAMPLE PPE POLICIES

Procedures

A. Hazard Assessment for PPE

(Safety Person or designated person), in conjunction with Supervisors, will conduct a walk-through survey of each work area to identify sources of work hazards. Each survey will be documented using the Hazard Assessment Certification Form, which identifies the work area surveyed, the person conducting the survey, findings of potential hazards, and date of the survey. (Safety Person or designated person) will keep the forms in the (Specify exact location, e.g., your company’s business files).

(Safety Person or designated person) will conduct, review, and update the hazard assessment for PPE whenever

- a job changes
- new equipment or process is installed
- there has been an accident
- whenever a supervisor or employee requests it
- or at least every year

Any new PPE requirements that are developed will be added into (Name of your business)’s written accident prevention program.

B. Selection of PPE

Once the hazards of a workplace have been identified, (Safety Person or designated person) will determine if the hazards can first be eliminated or reduced by methods other than PPE, i.e., methods that do not rely on employee behavior, such as engineering controls (refer to Appendix B – Controlling Hazards).

If such methods are not adequate or feasible, then (Safety Person or designated person) will determine the suitability of the PPE presently available; and as necessary, will select new or additional equipment which ensures a level of protection greater than the minimum required to protect our employees from the hazards (refer to Appendix C – Selection of PPE). Care will be taken to recognize the possibility of multiple and simultaneous exposure to a variety of hazards. Adequate protection against the highest level of each of the hazards will be recommended for purchase.

All personal protective clothing and equipment will be of safe design and construction for the work to be performed and will 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 will be procured or accepted for use.
SAMPLE PPE POLICIES

Newly purchased PPE must conform to the updated ANSI standards which have been incorporated into the PPE regulations, as follows:

- Eye and Face Protection ANSI Z87.1-1989
- Head Protection ANSI Z89.1-1986
- Foot Protection ANSI Z41.1-1991
- Hand Protection (There are no ANSI standards for gloves, however, selection must be based on the performance characteristics of the glove in relation to the tasks to be performed.)

Affected employees whose jobs require the use of PPE will be informed of the PPE selection and will be provided PPE by (Name of your business) at no charge. Careful consideration will be given to the comfort and proper fit of PPE in order to ensure that the right size is selected and that it will be used.

C. Training

Any worker required to wear PPE will receive training in the proper use and care of PPE before being allowed to perform work requiring the use of PPE. Periodic retraining will be offered to PPE users as needed. The training will include, but not necessarily be limited to, the following subjects:

- When PPE is necessary to be worn
- What PPE is necessary
- How to properly don, doff, adjust, and wear PPE
- The limitations of the PPE
- The proper care, maintenance, useful life, and disposal of the PPE

After the training, the employees will demonstrate that they understand how to use PPE properly, or they will be retrained.

Training of each employee will be documented using the Personal Protective Equipment Training Documentation Form (or whatever form your company uses) and kept on file. The document certifies that the employee has received and understood the required training on the specific PPE he/she will be using.

The PPE Training Quiz will be used to evaluate employees’ understanding and will be kept in the employee training records. (Note: This document, on p. 32, is not a requirement of the Washington Safety and Health Rules. It is only a RECOMMENDED form that you can choose to use to make sure that your employees have understood the training and can demonstrate proper use of PPE.)
SAMPLE PPE POLICIES

Retraining

The need for retraining will be indicated when

- an employee's work habits or knowledge indicates a lack of the necessary understanding, motivation, and skills required to use the PPE (i.e., uses PPE improperly)
- new equipment is installed
- changes in the work place make previous training out-of-date
- changes in the types of PPE to be used make previous training out-of-date

D. Cleaning and Maintenance of PPE

It is important that all PPE be kept clean and properly maintained. Cleaning is particularly important for eye and face protection where dirty or fogged lenses could impair vision. Employees must inspect, clean, and maintain their PPE according to the manufacturers' instructions before and after each use (see attached). (Attach a copy of the manufacturers' cleaning and care instructions for all PPE provided to your employees). Supervisors are responsible for ensuring that users properly maintain their PPE in good condition.

Personal protective equipment must not be shared between employees until it has been properly cleaned and sanitized. PPE will be distributed for individual use whenever possible.

If employees provide their own PPE, make sure that it is adequate for the work place hazards, and that it is maintained in a clean and reliable condition.

Defective or damaged PPE will not be used and will be immediately discarded and replaced.

NOTE: Defective equipment can be worse than no PPE at all. Employees would avoid a hazardous situation if they knew they were not protected; but they would get closer to the hazard if they erroneously believed they were protected, and therefore would be at greater risk.

It is also important to ensure that contaminated PPE which cannot be decontaminated is disposed of in a manner that protects employees from exposure to hazards.
E. Safety Disciplinary Policy

(Customize by adding your company name here) believes that a safety and health Accident Prevention Program is unenforceable without some type of disciplinary policy. Our company believes that in order to maintain a safe and healthful workplace, the employees must be cognizant and aware of all company, State, and Federal safety and health regulations as they apply to the specific job duties required. The following disciplinary policy is in effect and will be applied to all safety and health violations.

The following steps will be followed unless the seriousness of the violation would dictate going directly to Step 2 or Step 3.

1. A first time violation will be discussed orally between company supervision and the employee. This will be done as soon as possible.

2. A second time offense will be followed up in written form and a copy of this written documentation will be entered into the employee’s personnel folder.

3. A third time violation will result in time off or possible termination, depending on the seriousness of the violation.

(Customize this page by adding any additional disciplinary actions and deleting those that may not apply to your company.)
Sample Personal Protective Equipment (PPE) Policy

The purpose of the Personal Protective Equipment Policies (PPE) is to protect the employees of [name of company] from exposure to workplace hazards and the risk of injury through the use of personal protective equipment (PPE). PPE is not a substitute for more effective control methods and its use will be considered only when other means of protection against hazards are not adequate or feasible. It will be used in conjunction with other controls unless no other means of hazard control exist.

Personal protective equipment will be provided, used, and maintained when it has been determined that its use is required to ensure the safety and health of our employees and that such use will lessen the likelihood of occupational injury and/or illness.

This section addresses general PPE requirements, including eye and face, head, foot and leg, hand and arm, body (torso) protection, and protection from drowning. Separate programs exist for respiratory protection and hearing protection as the need for participation in these programs is established through industrial hygiene monitoring. [List other programs or policies requiring PPE such as hearing protection, Respiratory Protection, Fall Protection, etc., that you have at your workplace] are also addressed in [Identify the section or location in your Safety Program where these are found].

The [Name of your business] Personal Protective Equipment Policies includes:

- Responsibilities of supervisors and employees
- Hazard assessment and PPE selection
- Employee training
- Cleaning and Maintenance of PPE

Responsibilities

[Add any additional responsibilities or delete those that do not apply to your company]

Safety Coordinator [or person who has this responsibility]

Note: Depending on your business and the number of employees you have, you may simply have a “designated safety person” (who may be a supervisor/lead worker) or a larger organized safety and health unit. Customize this section to fit the needs of your policy.

[Name of safety person] is responsible for the development, implementation, and administration of [Name of company] PPE policies. This involves:

continued »
1. Conducting workplace hazard assessments to determine the presence of hazards which requires the use of PPE.

2. Selecting and purchasing PPE.

3. Reviewing, updating, and conducting PPE hazard assessments whenever:
   - A job changes
   - New equipment is used
   - There has been an accident
   - A supervisor or employee requests it
   - Or at least every year

4. Maintaining records on hazard assessments.

5. Maintaining records on PPE assignments and training.

6. Providing training, guidance, and assistance to supervisors and employees on the proper use, care, and cleaning of approved PPE.

7. Periodically re-evaluating the suitability of previously selected PPE.

8. Reviewing, updating, and evaluating the overall effectiveness of PPE use, training, and policies.

**Supervisors [lead personnel and/or designated persons]**

Supervisors have the primary responsibility for implementing and enforcing PPE use and policies in their work area. This involves:

1. Providing appropriate PPE and making it available to employees.

2. Ensuring that employees are trained on the proper use, care, and cleaning of PPE.

3. Ensuring that PPE training certification and evaluation forms are signed and given to [safety/designated person]

4. Ensuring that employees properly use and maintain their PPE, and follow [name of business] PPE policies and rules.

5. Notifying [name of business] management and the Safety Person when new hazards are introduced or when processes are added or changed.

6. Ensuring that defective or damaged PPE is immediately disposed of and replaced.

**Employees**

The PPE user is responsible for following the requirements of the PPE policies. This involves:

1. Properly wearing PPE as required.

2. Attending required training sessions.

3. Properly caring for, cleaning, maintaining, and inspecting PPE as required.


5. Informing the supervisor of the need to repair or replace PPE.

Employees who repeatedly disregard and do not follow PPE policies and rules will be: [add your disciplinary policies]

**Procedures**

**Hazard Assessment for PPE**

[Safety or designated person] in conjunction with Supervisors, will conduct a walk-through survey of each work area to identify sources of work hazards. Each survey will be documented using the Hazard Assessment Certification Form, which identifies the work area surveyed, the person conducting the survey, findings of potential hazards, and date of the survey. [Safety or designated person] will keep the forms in the [specify exact location]
[Safety or designated person] will conduct, review, and update the hazard assessment for PPE whenever:

- A job changes
- New equipment or process is installed
- There has been an accident
- Whenever a supervisor or employee requests it
- Or at least every year

Any new PPE requirements that are developed will be added into [name of business] written Safety Program.

Selection of PPE

Once the hazards of a workplace have been identified, [safety or designated person] will determine if the hazards can first be eliminated or reduced by methods other than PPE, i.e., methods that do not rely on employee behavior, such as engineering controls.

If such methods are not adequate or feasible, then [safety or designated person] will determine the suitability of the PPE presently available; and as necessary, will select new or additional equipment which ensures a level of protection greater than the minimum required to protect our employees from the hazards. Care will be taken to recognize the possibility of multiple and simultaneous exposure to a variety of hazards. Adequate protection against the highest level of each of the hazards will be recommended for purchase.

All personal protective clothing and equipment will be of safe design and construction for the work to be performed and will 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 will be procured or accepted for use. Newly purchased PPE must conform to the updated ANSI standards which have been incorporated into the PPE regulations, as follows:

- Eye and Face Protection ANSI Z87.1-2003
- Head Protection ANSI/ISEA Z89.1-2009
- Foot Protection ASTM F2412-05 and ASTM F2413-05
- Hand Protection (There are no ANSI standards for gloves, however, selection must be based on the performance characteristics of the glove in relation to the tasks to be performed.)

Affected employees whose jobs require the use of PPE will be informed of the PPE selection and will be provided PPE by [name of business] at no charge. Careful consideration will be given to the comfort and proper fit of PPE in order to ensure that the right size is selected and that it will be used.

Training

Any worker required to wear PPE will receive training in the proper use and care of PPE before being allowed to perform work requiring the use of PPE. Periodic retraining will be offered to PPE users as needed. The training will include, but not necessarily be limited to, the following subjects:

- When PPE is necessary to be worn
- What PPE is necessary
- How to properly don, doff, adjust, and wear PPE
- The limitations of the PPE
- The proper care, maintenance, useful life, and disposal of the PPE

After the training, the employees will demonstrate that they understand how to use PPE properly, or they will be retrained.
Training of each employee will be documented using the [name of form company uses it]; Personal Protective Equipment Training Documentation Form] and kept on file. The document certifies that the employee has received and understood the required training on the specific PPE he/she will be using.

The PPE Training Quiz will be used to evaluate employees' understanding and will be kept in the employee training records.

Retraining
The need for retraining will be indicated when:

- An employee's work habits or knowledge indicates a lack of the necessary understanding, motivation, and skills required to use the PPE (i.e., uses PPE improperly)
- New equipment is installed
- Changes in the work place make previous training out-of-date
- Changes in the types of PPE to be used make previous training out-of-date

Cleaning and Maintenance of PPE
It is important that all PPE be kept clean and properly maintained. Cleaning is particularly important for eye and face protection where dirty or fogged lenses could impair vision. Employees must inspect, clean, and maintain their PPE according to the manufacturers' instructions before and after each use (see attached). [Attach a copy of the manufacturers cleaning and care instructions for all PPE provided to employees]. Supervisors are responsible for ensuring that users properly maintain their PPE in good condition.

Personal protective equipment must not be shared between employees until it has been properly cleaned and sanitized. PPE will be distributed for individual use whenever possible.

If employees provide their own PPE, make sure that it is adequate for the work place hazards, and that it is maintained in a clean and reliable condition.

Defective or damaged PPE will not be used and will be immediately discarded and replaced.

NOTE: Defective equipment can be worse than no PPE at all. Employees would avoid a hazardous situation if they knew they were not protected; but they would get closer to the hazard if they erroneously believed they were protected, and therefore would be at greater risk.

It is also important to ensure that contaminated PPE which cannot be decontaminated is disposed of in a manner that protects employees from exposure to hazards.

Safety Disciplinary Policy
[Company name] believes that a safety and health Accident Prevention Program is unenforceable without some type of disciplinary policy. Our company believes that in order to maintain a safe and healthful workplace, the employees must be cognizant and aware of all company, State, and Federal safety and health regulations as they apply to the specific job duties required. The following disciplinary policy is in effect and will be applied to all safety and health violations.

The following steps will be followed unless the seriousness of the violation would dictate going directly to Step 2 or Step 3.

1. A first time violation will be discussed orally between company supervision and the employee. This will be done as soon as possible.
2. A second time offense will be followed up in written form and a copy of this written documentation will be entered into the employee's personnel folder.

3. A third time violation will result in time off or possible termination, depending on the seriousness of the violation.

[Add any additional disciplinary actions or delete those that do not apply to your company]

[See Personal Protective Equipment Training Certification Form, attached]

To learn more about Hanover Risk Solutions, visit hanoverrisksolutions.com

Why The Hanover?
The Hanover is a leading Property and Casualty insurance company dedicated to achieving world-class performance. Our commitment is to deliver the products, services, and technology of the best national companies with the responsiveness, market focus, and local decision making of the best regional companies. This powerful combination has been a proven success since our founding in 1852, and is backed by our financial strength rating of “A” (Excellent) from A.M. Best.
Sample PPE Training Certification Form

Employee’s name: ___________________ Employee ID No.: _______________________

Job title/work area: ___________________________________________________________

Employer: __________________________________________________________________

Trainer’s name (person completing this form): ____________________________________

Date of training: ____________________________________________________________

Types of PPE employee is being trained to use (List all PPE used):

___________________________________________________________________________

___________________________________________________________________________

The following information and training on the personal protective equipment (PPE) listed above were covered in the training session:

___ The limitations of personal protective equipment: PPE alone cannot protect the employee from on-the-job hazards.

___ What workplace hazards the employee faces, the types of personal protective equipment that the employee must use to be protected from these hazards, and how the PPE will protect the employee while doing his/her tasks.

___ When the employee must wear or use the personal protective equipment.

___ How to use the personal protective equipment properly on-the-job, including putting it on, taking it off, and wearing and adjusting it (if applicable) for a comfortable and effective fit.

___ How to properly care for and maintain the personal protective equipment: look for signs of wear, clean and disinfect, and dispose of PPE.

**Note to employee:** This form will be made a part of your personal file. Please read and understand its contents before signing.

(Employee) I understand the training I have received, and I can use PPE properly.

Employee’s signature: ____________________ Date: _______________________

(Trainer must check off)

___ Employee has shown an understanding of the training.

___ Employee has shown the ability to use the PPE properly.

Trainer’s signature: ____________________ Date: _______________________

Reference
Washington Department of Labor and Industries
Personal Protective Equipment

U.S. Department of Labor

Occupational Safety and Health Administration

OSHA 3151-12R
2004
Employers are responsible for providing a safe and healthy workplace for their employees. OSHA's role is to promote the safety and health of America's working men and women by setting and enforcing standards; providing training, outreach and education; establishing partnerships; and encouraging continual improvement in workplace safety and health.

This publication provides a general overview of a particular standards-related topic. This publication does not alter or determine compliance responsibilities which are set forth in OSHA standards, and the Occupational Safety and Health Act of 1970. Moreover, because interpretations and enforcement policy may change over time, for additional guidance on OSHA compliance requirements the reader should consult current OSHA administrative interpretations and decisions by the Occupational Safety and Health Review Commission and the courts.

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Introduction

Hazards exist in every workplace in many different forms: sharp edges, falling objects, flying sparks, chemicals, noise and a myriad of other potentially dangerous situations. The Occupational Safety and Health Administration (OSHA) requires that employers protect their employees from workplace hazards that can cause injury.

Controlling a hazard at its source is the best way to protect employees. Depending on the hazard or workplace conditions, OSHA recommends the use of engineering or work practice controls to manage or eliminate hazards to the greatest extent possible. For example, building a barrier between the hazard and the employees is an engineering control; changing the way in which employees perform their work is a work practice control.

When engineering, work practice and administrative controls are not feasible or do not provide sufficient protection, employers must provide personal protective equipment (PPE) to their employees and ensure its use. Personal protective equipment, commonly referred to as “PPE”, is equipment worn to minimize exposure to a variety of hazards. Examples of PPE include such items as gloves, foot and eye protection, protective hearing devices (earplugs, muffs) hard hats, respirators and full body suits.

This guide will help both employers and employees do the following:

- Understand the types of PPE.
- Know the basics of conducting a “hazard assessment” of the workplace.
- Select appropriate PPE for a variety of circumstances.
- Understand what kind of training is needed in the proper use and care of PPE.

The information in this guide is general in nature and does not address all workplace hazards or PPE requirements. The information, methods and procedures in this guide are based on the OSHA requirements for PPE as set forth in the Code of Federal Regulations (CFR) at 29 CFR 1910.132 (General requirements); 29 CFR 1910.133 (Eye and face protection); 29 CFR 1910.135 (Head protection); 29 CFR 1910.136 (Foot protection); 29 CFR 1910.137 (Electrical protective equipment); 29 CFR 1910.138 (Hand protection); and regulations that cover the construction industry, at 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); and 29 CFR 1926.102 (Eye and face protection);
and for the maritime industry at 29 CFR 1915.152 (General require-
ments); 29 CFR 1915.153 (Eye and face protection); 29 CFR 1915.155
(Head protection); 29 CFR 1915.156 (Foot protection); and 29 CFR
1915.157 (Hand and body protection).

This guide does not address PPE requirements related
to respiratory protection (29 CFR 1910.134). There is a brief
discussion of hearing protection in this publication but users
should refer to OSHA Publication 3074, "Hearing Conservation"
for more detailed information on the requirements to protect
employees’ hearing in the workplace.

The Requirement for PPE

To ensure the greatest possible protection for employees in
the workplace, the cooperative efforts of both employers and
employees will help in establishing and maintaining a safe and
healthful work environment.

In general, employers are responsible for:
- Performing a “hazard assessment” of the workplace to identify
  and control physical and health hazards.
- Identifying and providing appropriate PPE for employees.
- Training employees in the use and care of the PPE.
- Maintaining PPE, including replacing worn or damaged PPE.
- Periodically reviewing, updating and evaluating the effective-
  ness of the PPE program.

In general, employees should:
- Properly wear PPE,
- Attend training sessions on PPE,
- Care for, clean and maintain PPE, and
- Inform a supervisor of the need to repair or replace PPE.

Specific requirements for PPE are presented in many different
OSHA standards, published in 29 CFR. Some standards require that
employers provide PPE at no cost to the employee while others simply state that the employer must provide PPE. Appendix A at page 40 lists those standards that require the employer to provide PPE and those that require the employer to provide PPE at no cost to the employee.

In a final rule on employer-paid PPE published in November 2007, all PPE, with a few exceptions, will be provided at no cost to the employee. The Nov. 2007 final rule also clarified OSHA’s requirements regarding payment for employee-owned PPE and for replacement PPE. The final rule is published at 72 Fed. Reg. 64341-64430 (Nov. 15, 2007).

The Hazard Assessment

A first critical step in developing a comprehensive safety and health program is to identify physical and health hazards in the workplace. This process is known as a “hazard assessment.” Potential hazards may be physical or health-related and a comprehensive hazard assessment should identify hazards in both categories. Examples of physical hazards include moving objects, fluctuating temperatures, high intensity lighting, rolling or pinching objects, electrical connections and sharp edges. Examples of health hazards include overexposure to harmful dusts, chemicals or radiation.

The hazard assessment should begin with a walkthrough 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, and
- 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 walkthrough survey 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.
- Biologic hazards such as blood or other potentially infected material.

When the walkthrough is complete, the employer should organize and analyze the data so that it may be efficiently used in determining the proper types of PPE required at the worksite. The employer should become aware of the different types of PPE available and the levels of protection offered. It is definitely a good idea to select PPE that will provide a level of protection greater than the minimum required to protect employees from hazards.

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.

Documentation of the hazard assessment is required through a written certification that includes the following information:

- Identification of the workplace evaluated;
- Name of the person conducting the assessment;
- Date of the assessment; and
- Identification of the document certifying completion of the hazard assessment.
Selecting PPE

All PPE clothing and equipment should be of safe design and construction, and should be maintained in a clean and reliable fashion. Employers should take the fit and comfort of PPE into consideration when selecting appropriate items for their workplace. PPE that fits well and is comfortable to wear will encourage employee use of PPE. Most protective devices are available in multiple sizes and care should be taken to select the proper size for each employee. If several different types of PPE are worn together, make sure they are compatible. If PPE does not fit properly, it can make the difference between being safely covered or dangerously exposed. It may not provide the level of protection desired and may discourage employee use.

OSHA requires that many categories of PPE meet or be equivalent to standards developed by the American National Standards Institute (ANSI). ANSI has been preparing safety standards since the 1920s, when the first safety standard was approved to protect the heads and eyes of industrial workers. Employers who need to provide PPE in the categories listed below must make certain that any new equipment procured meets the cited ANSI standard. Existing PPE stocks must meet the ANSI standard in effect at the time of its manufacture or provide protection equivalent to PPE manufactured to the ANSI criteria. Employers should inform employees who provide their own PPE of the employer’s selection decisions and ensure that any employee-owned PPE used in the workplace conforms to the employer’s criteria, based on the hazard assessment, OSHA requirements and ANSI standards. 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.

**Training Employees in the Proper Use of PPE**

Employers are required to train each employee who must use PPE. Employees must be trained to know at least the following:

- When PPE is necessary.
- What PPE is necessary.
- How to properly put on, take off, adjust and wear the PPE.
- The limitations of the PPE.
- Proper care, maintenance, useful life and disposal of PPE.

Employers should make sure that each employee demonstrates an understanding of the PPE training as well as the ability to properly wear and use PPE before they are allowed to perform work requiring the use of the PPE. If an employer believes that a previously trained employee is not demonstrating the proper understanding and skill level in the use of PPE, that employee should receive retraining. Other situations that require additional or retraining of employees include the following circumstances: changes in the workplace or in the type of required PPE that make prior training obsolete.

The employer must document the training of each employee required to wear or use PPE by preparing a certification containing the name of each employee trained, the date of training and a clear identification of the subject of the certification.

**Eye and Face Protection**

Employees can be exposed to a large number of hazards that pose danger to their eyes and face. OSHA requires employers to ensure that employees have appropriate eye or face protection if they are exposed to eye or face hazards from flying particles, molten metal, liquid chemicals, acids or caustic liquids, chemical gases or vapors, potentially infected material or potentially harmful light radiation.
Many occupational eye injuries occur because employees are not wearing any eye protection while others result from wearing improper or poorly fitting eye protection. Employers must be sure that their employees wear appropriate eye and face protection and that the selected form of protection is appropriate to the work being performed and properly fits each employee exposed to the hazard.

Prescription Lenses

Everyday use of prescription corrective lenses will not provide adequate protection against most occupational eye and face hazards, so employers must make sure that employees with corrective lenses either wear eye protection that incorporates the prescription into the design or wear additional eye protection over their prescription lenses. It is important to ensure that the protective eyewear does not disturb the proper positioning of the prescription lenses so that the employee’s vision will not be inhibited or limited. Also, employees who wear contact lenses must wear eye or face PPE when working in hazardous conditions.

Eye Protection for Exposed Employees

OSHA suggests that eye protection be routinely considered for use by carpenters, electricians, machinists, mechanics, millwrights, plumbers and pipefitters, sheetmetal employees and tinsmiths, assemblers, sanders, grinding machine operators, sawyers, welders, laborers, chemical pro-cess operators and handlers, and timber cutting and logging workers. Employers of employees in other job categories should decide whether there is a need for eye and face PPE through a hazard assessment.

Examples of potential eye or face injuries include:

- Dust, dirt, metal or wood chips entering the eye from activities such as chipping, grinding, sawing, hammering, the use of power tools or even strong wind forces.
- Chemical splashes from corrosive substances, hot liquids, solvents or other hazardous solutions.
- Objects swinging into the eye or face, such as tree limbs, chains, tools or ropes.
- Radiant energy from welding, harmful rays from the use of lasers or other radiant light (as well as heat, glare, sparks, splash and flying particles).
Types of Eye Protection

Selecting the most suitable eye and face protection for employees should take into consideration the following elements:

- Ability to protect against specific workplace hazards.
- Should fit properly and be reasonably comfortable to wear.
- Should provide unrestricted vision and movement.
- Should be durable and cleanable.
- Should allow unrestricted functioning of any other required PPE.

The eye and face protection selected for employee use must clearly identify the manufacturer. Any new eye and face protective devices must comply with ANSI Z87.1-1989 or be at least as effective as this standard requires. Any equipment purchased before this requirement took effect on July 5, 1994, must comply with the earlier ANSI Standard (ANSI Z87.1-1968) or be shown to be equally effective.

An employer may choose to provide one pair of protective eyewear for each position rather than individual eyewear for each employee. If this is done, the employer must make sure that employees disinfect shared protective eyewear after each use. Protective eyewear with corrective lenses may only be used by the employee for whom the corrective prescription was issued and may not be shared among employees.

Some of the most common types of eye and face protection include the following:

- **Safety spectacles.** These protective eyeglasses have safety frames constructed of metal or plastic and impact-resistant lenses. Side shields are available on some models.

- **Goggles.** These are tight-fitting eye protection that completely cover the eyes, eye sockets and the facial area immediately surrounding the eyes and provide protection from impact, dust and splashes. Some goggles will fit over corrective lenses.

- **Welding shields.** Constructed of vulcanized fiber or fiberglass and fitted with a filtered lens, welding shields protect eyes from burns caused by infrared or intense radiant light; they also protect both the eyes and face from flying sparks, metal spatter and slag chips produced during welding, brazing, soldering and
cutting operations. OSHA requires filter lenses to have a shade number appropriate to protect against the specific hazards of the work being performed in order to protect against harmful light radiation.

- **Laser safety goggles.** These specialty goggles protect against intense concentrations of light produced by lasers. The type of laser safety goggles an employer chooses will depend upon the equipment and operating conditions in the workplace.

- **Face shields.** These transparent sheets of plastic extend from the eyebrows to below the chin and across the entire width of the employee’s head. Some are polarized for glare protection. Face shields protect against nuisance dusts and potential splashes or sprays of hazardous liquids but will not provide adequate protection against impact hazards. Face shields used in combination with goggles or safety spectacles will provide additional protection against impact hazards.

Each type of protective eyewear is designed to protect against specific hazards. Employers can identify the specific workplace hazards that threaten employees’ eyes and faces by completing a hazard assessment as outlined in the earlier section.

**Welding Operations**

The intense light associated with welding operations can cause serious and sometimes permanent eye damage if operators do not wear proper eye protection. The intensity of light or radiant energy produced by welding, cutting or brazing operations varies according to a number of factors including the task producing the light, the electrode size and the arc current. The following table shows the minimum protective shades for a variety of welding, cutting and brazing operations in general industry and in the shipbuilding industry.
### Table 1
Filter Lenses for Protection Against Radiant Energy

<table>
<thead>
<tr>
<th>Operations</th>
<th>Electrode size in 1/32&quot; (0.8mm)</th>
<th>Arc current</th>
<th>Minimum* protective shade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shielded metal arc welding</td>
<td>&lt; 3</td>
<td>&lt; 60</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>3 - 5</td>
<td>60 - 160</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>5 - 8</td>
<td>160 - 250</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>&gt; 8</td>
<td>250 - 550</td>
<td>11</td>
</tr>
<tr>
<td>Gas metal arc welding and flux cored arc welding</td>
<td>&lt; 60</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td></td>
<td>60 - 160</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td></td>
<td>160 - 250</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td></td>
<td>250 - 500</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Gas tungsten arc welding</td>
<td>&lt; 50</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td></td>
<td>50 - 150</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td></td>
<td>150 - 500</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Air carbon (light)</td>
<td>&lt; 500</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Arc cutting (heavy)</td>
<td>500 - 1,000</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>Plasma arc welding</td>
<td>&lt; 20</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td></td>
<td>20 - 100</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td></td>
<td>100 - 400</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td></td>
<td>400 - 800</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>Plasma arc cutting (light)**</td>
<td>&lt; 300</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>(medium)**</td>
<td>300 - 400</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>(heavy)**</td>
<td>400 - 800</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Torch brazing</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Torch soldering</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carbon arc welding</td>
<td>14</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Table 1 (continued)
**Filter Lenses for Protection Against Radiant Energy**

<table>
<thead>
<tr>
<th>Operations</th>
<th>Plate thickness inches</th>
<th>Plate thickness mm</th>
<th>Minimum* protective shade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gas welding:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Light</td>
<td>&lt; 1/8</td>
<td>&lt; 3.2</td>
<td>4</td>
</tr>
<tr>
<td>Medium</td>
<td>1/8 - 1/2</td>
<td>3.2 - 12.7</td>
<td>5</td>
</tr>
<tr>
<td>Gas welding:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heavy</td>
<td>&gt; 1/2</td>
<td>&gt; 12.7</td>
<td>6</td>
</tr>
<tr>
<td>Oxygen cutting:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Light</td>
<td>&lt; 1</td>
<td>&lt; 25</td>
<td>3</td>
</tr>
<tr>
<td>Medium</td>
<td>1 - 6</td>
<td>25 - 150</td>
<td>4</td>
</tr>
<tr>
<td>Oxygen cutting:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heavy</td>
<td>&gt; 6</td>
<td>&gt; 150</td>
<td>5</td>
</tr>
</tbody>
</table>


* As a rule of thumb, start with a shade that is too dark to see the weld zone. Then go to a lighter shade which gives sufficient view of the weld zone without going below the minimum. In oxyfuel gas welding or cutting where the torch produces a high yellow light, it is desirable to use a filter lens that absorbs the yellow or sodium line in the visible light of the (spectrum) operation.

** These values apply where the actual arc is clearly seen. Experience has shown that lighter filters may be used when the arc is hidden by the workpiece.
The construction industry has separate requirements for filter lens protective levels for specific types of welding operations, as indicated in the table below:

### Table 2

**Construction Industry Requirements for Filter Lens Shade Numbers for Protection Against Radiant Energy**

<table>
<thead>
<tr>
<th>Welding Operation</th>
<th>Shade Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shielded metal-arc welding 1/16-, 3/32-, 1/8-, 5/32-inch diameter electrodes</td>
<td>10</td>
</tr>
<tr>
<td>Gas-shielded arc welding (nonferrous) 1/16-, 3/32-, 1/8-, 5/32-inch diameter electrodes</td>
<td>11</td>
</tr>
<tr>
<td>Gas-shielded arc welding (ferrous) 1/16-, 3/32-, 1/8-, 5/32-inch diameter electrodes</td>
<td>12</td>
</tr>
<tr>
<td>Shielded metal-arc welding 3/16-, 7/32-, 1/4-inch diameter electrodes</td>
<td>12</td>
</tr>
<tr>
<td>5/16-, 3/8-inch diameter electrodes</td>
<td>14</td>
</tr>
<tr>
<td>Atomic hydrogen welding</td>
<td>10 - 14</td>
</tr>
<tr>
<td>Carbon-arc welding</td>
<td>14</td>
</tr>
<tr>
<td>Soldering</td>
<td>2</td>
</tr>
<tr>
<td>Torch brazing</td>
<td>3 or 4</td>
</tr>
<tr>
<td>Light cutting, up to 1 inch</td>
<td>3 or 4</td>
</tr>
<tr>
<td>Medium cutting, 1 to 6 inches</td>
<td>4 or 5</td>
</tr>
<tr>
<td>Heavy cutting, more than 6 inches</td>
<td>5 or 6</td>
</tr>
<tr>
<td>Gas welding (light), up to 1/8-inch</td>
<td>4 or 5</td>
</tr>
<tr>
<td>Gas welding (medium), 1/8- to 1/2-inch</td>
<td>5 or 6</td>
</tr>
<tr>
<td>Gas welding (heavy), more than 1/2-inch</td>
<td>6 or 8</td>
</tr>
</tbody>
</table>

Source: 29 CFR 1926.102(b)(1).
Laser Operations

Laser light radiation can be extremely dangerous to the unprotected eye and direct or reflected beams can cause permanent eye damage. Laser retinal burns can be painless, so it is essential that all personnel in or around laser operations wear appropriate eye protection.

Laser safety goggles should protect for the specific wavelength of the laser and must be of sufficient optical density for the energy involved. Safety goggles intended for use with laser beams must be labeled with the laser wavelengths for which they are intended to be used, the optical density of those wavelengths and the visible light transmission.

The table below lists maximum power or energy densities and appropriate protection levels for optical densities 5 through 8.

<table>
<thead>
<tr>
<th>Intensity, CW maximum power density (watts/cm²)</th>
<th>Attenuation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Optical density (O.D.)</td>
</tr>
<tr>
<td>$10^{-2}$</td>
<td>5</td>
</tr>
<tr>
<td>$10^{-1}$</td>
<td>6</td>
</tr>
<tr>
<td>1.0</td>
<td>7</td>
</tr>
<tr>
<td>10.0</td>
<td>8</td>
</tr>
</tbody>
</table>

Source: 29 CFR 1926.102(b)(2).

Head Protection

Protecting employees from potential head injuries is a key element of any safety program. A head injury can impair an employee for life or it can be fatal. Wearing a safety helmet or hard hat is one of the easiest ways to protect an employee's head.
from injury. Hard hats can protect employees from impact and penetration hazards as well as from electrical shock and burn hazards.

Employers must ensure that their employees wear head protection if any of the following apply:

- Objects might fall from above and strike them on the head;
- They might bump their heads against fixed objects, such as exposed pipes or beams; or
- There is a possibility of accidental head contact with electrical hazards.

Some examples of occupations in which employees should be required to wear head protection include construction workers, carpenters, electricians, linemen, plumbers and pipefitters, timber and log cutters, welders, among many others. Whenever there is a danger of objects falling from above, such as working below others who are using tools or working under a conveyor belt, head protection must be worn. Hard hats must be worn with the bill forward to protect employees properly.

In general, protective helmets or hard hats should do the following:

- Resist penetration by objects.
- Absorb the shock of a blow.
- Be water-resistant and slow burning.
- Have clear instructions explaining proper adjustment and replacement of the suspension and headband.

Hard hats must have a hard outer shell and a shock-absorbing lining that incorporates a headband and straps that suspend the shell from 1 to 1 1/4 inches (2.54 cm to 3.18 cm) away from the head. This type of design provides shock absorption during an impact and ventilation during normal wear.

Protective headgear must meet ANSI Standard Z89.1-1986 (Protective Headgear for Industrial Workers) or provide an equivalent level of protection. Helmets purchased before July 5, 1994 must comply with the earlier ANSI Standard (Z89.1-1969) or provide equivalent protection.
Types of Hard Hats

There are many types of hard hats available in the marketplace today. In addition to selecting protective headgear that meets ANSI standard requirements, employers should ensure that employees wear hard hats that provide appropriate protection against potential workplace hazards. It is important for employers to understand all potential hazards when making this selection, including electrical hazards. This can be done through a comprehensive hazard analysis and an awareness of the different types of protective headgear available.

Hard hats are divided into three industrial classes:

- **Class A hard hats** provide impact and penetration resistance along with limited voltage protection (up to 2,200 volts).

- **Class B hard hats** provide the highest level of protection against electrical hazards, with high-voltage shock and burn protection (up to 20,000 volts). They also provide protection from impact and penetration hazards by flying/falling objects.

- **Class C hard hats** provide lightweight comfort and impact protection but offer no protection from electrical hazards.

Another class of protective headgear on the market is called a “bump hat,” designed for use in areas with low head clearance. They are recommended for areas where protection is needed from head bumps and lacerations. These are not designed to protect against falling or flying objects and are not ANSI approved. It is essential to check the type of hard hat employees are using to ensure that the equipment provides appropriate protection. Each hat should bear a label inside the shell that lists the manufacturer, the ANSI designation and the class of the hat.

Size and Care Considerations

Head protection that is either too large or too small is inappropriate for use, even if it meets all other requirements. Protective headgear must fit appropriately on the body and for the head size of each individual. Most protective headgear comes in a variety of sizes with adjustable headbands to ensure a proper fit (many adjust in 1/8-inch increments). A proper fit should allow sufficient clearance between the shell and the suspension system for
ventilation and distribution of an impact. The hat should not bind, slip, fall off or irritate the skin.

Some protective headgear allows for the use of various accessories to help employees deal with changing environmental conditions, such as slots for earmuffs, safety glasses, face shields and mounted lights. Optional brims may provide additional protection from the sun and some hats have channels that guide rainwater away from the face. Protective headgear accessories must not compromise the safety elements of the equipment.

Periodic cleaning and inspection will extend the useful life of protective headgear. A daily inspection of the hard hat shell, suspension system and other accessories for holes, cracks, tears or other damage that might compromise the protective value of the hat is essential. Paints, paint thinners and some cleaning agents can weaken the shells of hard hats and may eliminate electrical resistance. Consult the helmet manufacturer for information on the effects of paint and cleaning materials on their hard hats. Never drill holes, paint or apply labels to protective headgear as this may reduce the integrity of the protection. Do not store protective headgear in direct sunlight, such as on the rear window shelf of a car, since sunlight and extreme heat can damage them.

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.

**Foot and Leg Protection**

Employees who face possible foot or leg injuries from falling or rolling objects or from crushing or penetrating materials should
wear protective footwear. Also, employees whose work involves exposure to hot substances or corrosive or poisonous materials must have protective gear to cover exposed body parts, including legs and feet. If an employee’s feet may be exposed to electrical hazards, non-conductive footwear should be worn. On the other hand, workplace exposure to static electricity may necessitate the use of conductive footwear.

Examples of situations in which an employee should wear foot and/or leg protection include:

- When heavy objects such as barrels or tools might roll onto or fall on the employee’s feet;
- Working with sharp objects such as nails or spikes that could pierce the soles or uppers of ordinary shoes;
- Exposure to molten metal that might splash on feet or legs;
- Working on or around hot, wet or slippery surfaces; and
- Working when electrical hazards are present.

Safety footwear must meet ANSI minimum compression and impact performance standards in ANSI Z41-1991 (American National Standard for Personal Protection-Protective Footwear) or provide equivalent protection. Footwear purchased before July 5, 1994, must meet or provide equivalent protection to the earlier ANSI Standard (ANSI Z41.1-1967). All ANSI-approved footwear has a protective toe and offers impact and compression protection. But the type and amount of protection is not always the same. Different footwear protects in different ways. Check the product’s labeling or consult the manufacturer to make sure the footwear will protect the user from the hazards they face.

Foot and leg protection choices include the following:

- **Leggings** protect the lower legs and feet from heat hazards such as molten metal or welding sparks. Safety snaps allow leggings to be removed quickly.

- **Metatarsal guards** protect the instep area from impact and compression. Made of aluminum, steel, fiber or plastic, these guards may be strapped to the outside of shoes.

- **Toe guards** fit over the toes of regular shoes to protect the toes from impact and compression hazards. They may be made of steel, aluminum or plastic.
- **Combination foot and shin guards** protect the lower legs and feet, and may be used in combination with toe guards when greater protection is needed.

- **Safety shoes** have impact-resistant toes and heat-resistant soles that protect the feet against hot work surfaces common in roofing, paving and hot metal industries. The metal insoles of some safety shoes protect against puncture wounds. Safety shoes may also be designed to be electrically conductive to prevent the buildup of static electricity in areas with the potential for explosive atmospheres or nonconductive to protect employees from workplace electrical hazards.

**Special Purpose Shoes**

- **Electrically conductive shoes** provide protection against the buildup of static electricity. Employees working in explosive and hazardous locations such as explosives manufacturing facilities or grain elevators must wear conductive shoes to reduce the risk of static electricity buildup on the body that could produce a spark and cause an explosion or fire. Foot powder should not be used in conjunction with protective conductive footwear because it provides insulation, reducing the conductive ability of the shoes. Silk, wool and nylon socks can produce static electricity and should not be worn with conductive footwear. Conductive shoes must be removed when the task requiring their use is completed. 
  Note: Employees exposed to electrical hazards must never wear conductive shoes.

- **Electrical hazard, safety-toe shoes** are nonconductive and will prevent the wearers’ feet from completing an electrical circuit to the ground. These shoes can protect against open circuits of up to 600 volts in dry conditions and should be used in conjunction with other insulating equipment and additional precautions to reduce the risk of an employee becoming a path for hazardous electrical energy. The insulating protection of electrical hazard, safety-toe shoes may be compromised if the shoes become wet, the soles are worn through, metal particles become embedded in the sole or heel, or employees touch conductive, grounded items. 
  Note: Nonconductive footwear must not be used in explosive or hazardous locations.
Foundry Shoes

In addition to insulating the feet from the extreme heat of molten metal, foundry shoes keep hot metal from lodging in shoe eyelets, tongues or other shoe parts. These snug-fitting leather or leather-substitute shoes have leather or rubber soles and rubber heels. All foundry shoes must have built-in safety toes.

Care of Protective Footwear

As with all protective equipment, safety footwear should be inspected prior to each use. Shoes and leggings should be checked for wear and tear at reasonable intervals. This includes looking for cracks or holes, separation of materials, broken buckles or laces. The soles of shoes should be checked for pieces of metal or other embedded items that could present electrical or tripping hazards. Employees should follow the manufacturers’ recommendations for cleaning and maintenance of protective footwear.

Hand and Arm Protection

If a workplace hazard assessment reveals that employees face potential injury to hands and arms that cannot be eliminated through engineering and work practice controls, employers must ensure that employees wear appropriate protection. Potential hazards include skin absorption of harmful substances, chemical or thermal burns, electrical dangers, bruises, abrasions, cuts, punctures, fractures and amputations. Protective equipment includes gloves, finger guards and arm coverings or elbow-length gloves.

Employers should explore all possible engineering and work practice controls to eliminate hazards and use PPE to provide additional protection against hazards that cannot be completely eliminated through other means. For example, machine guards may eliminate a hazard. Installing a barrier to prevent employees from placing their hands at the point of contact between a table saw blade and the item being cut is another method.
Types of Protective Gloves

There are many types of gloves available today to protect against a wide variety of hazards. The nature of the hazard and the operation involved will affect the selection of gloves. The variety of potential occupational hand injuries makes selecting the right pair of gloves challenging. It is essential that employees use gloves specifically designed for the hazards and tasks found in their workplace because gloves designed for one function may not protect against a different function even though they may appear to be an appropriate protective device.

The following are examples of some factors that may influence the selection of protective gloves for a workplace.

- Type of chemicals handled.
- Nature of contact (total immersion, splash, etc.).
- Duration of contact.
- Area requiring protection (hand only, forearm, arm).
- Grip requirements (dry, wet, oily).
- Thermal protection.
- Size and comfort.
- Abrasion/resistance requirements.

Gloves made from a wide variety of materials are designed for many types of workplace hazards. In general, gloves fall into four groups:

- Gloves made of leather, canvas or metal mesh;
- Fabric and coated fabric gloves;
- Chemical- and liquid-resistant gloves;
- Insulating rubber gloves (See 29 CFR 1910.137 and the following section on electrical protective equipment for detailed requirements on the selection, use and care of insulating rubber gloves).

Leather, Canvas or Metal Mesh Gloves

Sturdy gloves made from metal mesh, leather or canvas provide protection against cuts and burns. Leather or canvass gloves also protect against sustained heat.
- **Leather gloves** protect against sparks, moderate heat, blows, chips and rough objects.

- **Aluminized gloves** provide reflective and insulating protection against heat and require an insert made of synthetic materials to protect against heat and cold.

- **Aramid fiber gloves** protect against heat and cold, are cut- and abrasive-resistant and wear well.

- **Synthetic gloves** of various materials offer protection against heat and cold, are cut- and abrasive-resistant and may withstand some diluted acids. These materials do not stand up against alkalis and solvents.

**Fabric and Coated Fabric Gloves**

Fabric and coated fabric gloves are made of cotton or other fabric to provide varying degrees of protection.

- **Fabric gloves** protect against dirt, slivers, chafing and abrasions. They do not provide sufficient protection for use with rough, sharp or heavy materials. Adding a plastic coating will strengthen some fabric gloves.

- **Coated fabric gloves** are normally made from cotton flannel with napping on one side. By coating the unappled side with plastic, fabric gloves are transformed into general-purpose hand protection offering slip-resistant qualities. These gloves are used for tasks ranging from handling bricks and wire to chemical laboratory containers. When selecting gloves to protect against chemical exposure hazards, always check with the manufacturer or review the manufacturer’s product literature to determine the gloves’ effectiveness against specific workplace chemicals and conditions.

**Chemical- and Liquid-Resistant Gloves**

Chemical-resistant gloves are made with different kinds of rubber: natural, butyl, neoprene, nitrile and fluorocarbon (viton); or various kinds of plastic: polyvinyl chloride (PVC), polyvinyl alcohol and polyethylene. These materials can be blended or laminated
for better performance. As a general rule, the thicker the glove material, the greater the chemical resistance but thick gloves may impair grip and dexterity, having a negative impact on safety.

Some examples of chemical-resistant gloves include:

- **Butyl gloves** are made of a synthetic rubber and protect against a wide variety of chemicals, such as peroxide, rocket fuels, highly corrosive acids (nitric acid, sulfuric acid, hydrofluoric acid and red-fuming nitric acid), strong bases, alcohols, aldehydes, ketones, esters and nitrocompounds. Butyl gloves also resist oxidation, ozone corrosion and abrasion, and remain flexible at low temperatures. Butyl rubber does not perform well with aliphatic and aromatic hydrocarbons and halogenated solvents.

- **Natural (latex) rubber gloves** are comfortable to wear, which makes them a popular general-purpose glove. They feature outstanding tensile strength, elasticity and temperature resistance. In addition to resisting abrasions caused by grinding and polishing, these gloves protect employees’ hands from most water solutions of acids, alkalis, salts and ketones. Latex gloves have caused allergic reactions in some individuals and may not be appropriate for all employees. Hypoallergenic gloves, glove liners and powderless gloves are possible alternatives for employees who are allergic to latex gloves.

- **Neoprene gloves** are made of synthetic rubber and offer good pliability, finger dexterity, high density and tear resistance. They protect against hydraulic fluids, gasoline, alcohols, organic acids and alkalis. They generally have chemical and wear resistance properties superior to those made of natural rubber.

- **Nitrile gloves** are made of a copolymer and provide protection from chlorinated solvents such as trichloroethylene and perchloroethylene. Although intended for jobs requiring dexterity and sensitivity, nitrile gloves stand up to heavy use even after prolonged exposure to substances that cause other gloves to deteriorate. They offer protection when working with oils, greases, acids, caustics and alcohols but are generally not recommended for use with strong oxidizing agents, aromatic solvents, ketones and acetates.
The following table from the U.S. Department of Energy (Occupational Safety and Health Technical Reference Manual) rates various gloves as being protective against specific chemicals and will help you select the most appropriate gloves to protect your employees. The ratings are abbreviated as follows: VG: Very Good; G: Good; F: Fair; P: Poor (not recommended). Chemicals marked with an asterisk (*) are for limited service.

### Table 4
**Chemical Resistance Selection Chart for Protective Gloves**

<table>
<thead>
<tr>
<th>Chemical</th>
<th>Neoprene Latex/Rubber</th>
<th>Butyl</th>
<th>Nitrile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acetaldehyde*</td>
<td>VG</td>
<td>G</td>
<td>VG</td>
</tr>
<tr>
<td>Acetic acid</td>
<td>VG</td>
<td>VG</td>
<td>VG</td>
</tr>
<tr>
<td>Acetone*</td>
<td>G</td>
<td>VG</td>
<td>VG</td>
</tr>
<tr>
<td>Ammonium hydroxide</td>
<td>VG</td>
<td>VG</td>
<td>VG</td>
</tr>
<tr>
<td>Amy acetate*</td>
<td>F</td>
<td>P</td>
<td>F</td>
</tr>
<tr>
<td>Aniline</td>
<td>G</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>Benzaldehyde*</td>
<td>F</td>
<td>F</td>
<td>G</td>
</tr>
<tr>
<td>Benzene*</td>
<td>P</td>
<td>P</td>
<td>P</td>
</tr>
<tr>
<td>Butyl acetate</td>
<td>G</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>Butyl alcohol</td>
<td>VG</td>
<td>VG</td>
<td>VG</td>
</tr>
<tr>
<td>Carbon disulfide</td>
<td>F</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>Carbon tetrachloride*</td>
<td>F</td>
<td>P</td>
<td>P</td>
</tr>
<tr>
<td>Castor oil</td>
<td>F</td>
<td>P</td>
<td>F</td>
</tr>
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<td>Chlorobenzene*</td>
<td>F</td>
<td>P</td>
<td>F</td>
</tr>
<tr>
<td>Chloroform*</td>
<td>G</td>
<td>P</td>
<td>P</td>
</tr>
<tr>
<td>Chloronaphthalene</td>
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<td>VG</td>
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<td>G</td>
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<tr>
<td>Dibutyl phthalate*</td>
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<tr>
<td>Diesel fuel</td>
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<td>P</td>
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</tr>
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<td>Diisobutyl ketone</td>
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<td>G</td>
</tr>
<tr>
<td>Dimethylformamide</td>
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<td>F</td>
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<tr>
<td>Chemical</td>
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<td>VG</td>
<td>VG</td>
</tr>
<tr>
<td>---------------------------</td>
<td>----</td>
<td>----</td>
<td>----</td>
</tr>
<tr>
<td>Epoxy resins, dry</td>
<td>G</td>
<td>F</td>
<td>G</td>
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<td>Ethyl acetate*</td>
<td>G</td>
<td>P</td>
<td>G</td>
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<tr>
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<td>VG</td>
<td>VG</td>
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<td>G</td>
<td>VG</td>
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<tr>
<td>Ethylene dichloride*</td>
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<tr>
<td>Ethylene glycol</td>
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<tr>
<td>Freon 11</td>
<td>G</td>
<td>P</td>
<td>F</td>
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<tr>
<td>Freon 12</td>
<td>G</td>
<td>P</td>
<td>F</td>
</tr>
<tr>
<td>Freon 21</td>
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<td>P</td>
<td>F</td>
</tr>
<tr>
<td>Freon 22</td>
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<td>P</td>
<td>F</td>
</tr>
<tr>
<td>Furfural*</td>
<td>G</td>
<td>G</td>
<td>G</td>
</tr>
<tr>
<td>Gasoline, leaded</td>
<td>G</td>
<td>P</td>
<td>F</td>
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<tr>
<td>Gasoline, unleaded</td>
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<tr>
<td>Glycerin</td>
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<td>VG</td>
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<tr>
<td>Hexane</td>
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<td>P</td>
<td>P</td>
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<tr>
<td>Hydrazine (65%)</td>
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<td>G</td>
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<tr>
<td>Hydrochloric acid</td>
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<tr>
<td>Hydrofluoric acid (48%)</td>
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<tr>
<td>Hydrogen peroxide (30%)</td>
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<td>Lacquer thinners</td>
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<tr>
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<tr>
<td>Methyl chloride*</td>
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<td>P</td>
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<td>Chemical</td>
<td>G</td>
<td>G</td>
<td>VG</td>
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<tr>
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</tr>
<tr>
<td>Methyl ethyl ketone*</td>
<td>G</td>
<td>G</td>
<td>VG</td>
</tr>
<tr>
<td>Methyl isobutyl ketone*</td>
<td>F</td>
<td>F</td>
<td>VG</td>
</tr>
<tr>
<td>Methyl methacrylate</td>
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<td>Monoethanolamine</td>
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<td>Naphthalene</td>
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<td>Napthas, aliphatic</td>
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<td>G</td>
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<tr>
<td>Napthas, aromatic</td>
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</tr>
<tr>
<td>Nitric acid*</td>
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<td>Nitric acid, red and white</td>
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<td>Nitromethane (95.5%)*</td>
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<td>P</td>
<td>F</td>
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<td>Nitropropane (95.5%)</td>
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<tr>
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<tr>
<td>Oleic acid</td>
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<tr>
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<tr>
<td>Petroleum distillates</td>
<td>G</td>
<td>P</td>
<td>P</td>
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<tr>
<td>(naphtha)</td>
<td>VG</td>
<td>F</td>
<td>G</td>
</tr>
<tr>
<td>Phenol</td>
<td>VG</td>
<td>G</td>
<td>VG</td>
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<tr>
<td>Potassium hydroxide</td>
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</tr>
<tr>
<td>Propyl acetate</td>
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<tr>
<td>Propyl alcohol</td>
<td>VG</td>
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<td>Propyl alcohol (iso)</td>
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<td>Sodium hydroxide</td>
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<tr>
<td>Styrene</td>
<td>P</td>
<td>P</td>
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</tr>
<tr>
<td>Styrene (100%)</td>
<td>P</td>
<td>P</td>
<td>P</td>
</tr>
<tr>
<td>Sulfuric acid</td>
<td>G</td>
<td>G</td>
<td>G</td>
</tr>
<tr>
<td>Tannic acid (65)</td>
<td>VG</td>
<td>VG</td>
<td>VG</td>
</tr>
<tr>
<td>Tetrahydrofuran</td>
<td>P</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>Toluene*</td>
<td>F</td>
<td>P</td>
<td>P</td>
</tr>
<tr>
<td>Toluene diisocyanate (TDI)</td>
<td>F</td>
<td>G</td>
<td>G</td>
</tr>
</tbody>
</table>
Table 4 (continued) Chemical Resistance Selection Chart for Protective Gloves

<table>
<thead>
<tr>
<th>Compound</th>
<th>E</th>
<th>D</th>
<th>C</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trichloroethylene*</td>
<td>F</td>
<td>F</td>
<td>P</td>
<td>G</td>
</tr>
<tr>
<td>Triethanolamine (85%)</td>
<td>VG</td>
<td>G</td>
<td>G</td>
<td>VG</td>
</tr>
<tr>
<td>Tung oil</td>
<td>VG</td>
<td>P</td>
<td>F</td>
<td>VG</td>
</tr>
<tr>
<td>Turpentine</td>
<td>G</td>
<td>F</td>
<td>F</td>
<td>VG</td>
</tr>
<tr>
<td>Xylene*</td>
<td>P</td>
<td>P</td>
<td>P</td>
<td>F</td>
</tr>
</tbody>
</table>

Note: When selecting chemical-resistant gloves be sure to consult the manufacturer’s recommendations, especially if the gloved hand(s) will be immersed in the chemical.

Care of Protective Gloves

Protective gloves should be inspected before each use to ensure that they are not torn, punctured or made ineffective in any way. A visual inspection will help detect cuts or tears but a more thorough inspection by filling the gloves with water and tightly rolling the cuff towards the fingers will help reveal any pinhole leaks. Gloves that are discolored or stiff may also indicate deficiencies caused by excessive use or degradation from chemical exposure.

Any gloves with impaired protective ability should be discarded and replaced. Reuse of chemical-resistant gloves should be evaluated carefully, taking into consideration the absorptive qualities of the gloves. A decision to reuse chemically-exposed gloves should take into consideration the toxicity of the chemicals involved and factors such as duration of exposure, storage and temperature.

Body Protection

Employees who face possible bodily injury of any kind that cannot be eliminated through engineering, work practice or administrative controls, must wear appropriate body protection while performing their jobs. In addition to cuts and radiation, the following are examples of workplace hazards that could cause bodily injury:

- Temperature extremes;
- Hot splashes from molten metals and other hot liquids;
Potential impacts from tools, machinery and materials;

- Hazardous chemicals.

There are many varieties of protective clothing available for specific hazards. Employers are required to ensure that their employees wear personal protective equipment only for the parts of the body exposed to possible injury. Examples of body protection include laboratory coats, coveralls, vests, jackets, aprons, surgical gowns and full body suits.

If a hazard assessment indicates a need for full body protection against toxic substances or harmful physical agents, the clothing should be carefully inspected before each use, it must fit each employee properly and it must function properly and for the purpose for which it is intended.

Protective clothing comes in a variety of materials, each effective against particular hazards, such as:

- **Paper-like fiber** used for disposable suits provide protection against dust and splashes.

- **Treated wool and cotton** adapts well to changing temperatures, is comfortable, and fire-resistant and protects against dust, abrasions and rough and irritating surfaces.

- **Duck** is a closely woven cotton fabric that protects against cuts and bruises when handling heavy, sharp or rough materials.

- **Leather** is often used to protect against dry heat and flames.

- **Rubber, rubberized fabrics, neoprene and plastics** protect against certain chemicals and physical hazards. When chemical or physical hazards are present, check with the clothing manufacturer to ensure that the material selected will provide protection against the specific hazard.

### Hearing Protection

Determining the need to provide hearing protection for employees can be challenging. Employee exposure to excessive noise depends upon a number of factors, including:

- The loudness of the noise as measured in decibels (dB).

- The duration of each employee’s exposure to the noise.

- Whether employees move between work areas with different noise levels.
- Whether noise is generated from one or multiple sources.

Generally, the louder the noise, the shorter the exposure time before hearing protection is required. For instance, employees may be exposed to a noise level of 90 dB for 8 hours per day (unless they experience a Standard Threshold Shift) before hearing protection is required. On the other hand, if the noise level reaches 115 dB hearing protection is required if the anticipated exposure exceeds 15 minutes.

For a more detailed discussion of the requirements for a comprehensive hearing conservation program, see OSHA Publication 3074 (2002), “Hearing Conservation” or refer to the OSHA standard at 29 CFR 1910.95, Occupational Noise Exposure, section (c).

Table 5, below, shows the permissible noise exposures that require hearing protection for employees exposed to occupational noise at specific decibel levels for specific time periods. Noises are considered continuous if the interval between occurrences of the maximum noise level is one second or less. Noises not meeting this definition are considered impact or impulse noises (loud momentary explosions of sound) and exposures to this type of noise must not exceed 140 dB. Examples of situations or tools that may result in impact or impulse noises are powder-actuated nail guns, a punch press or drop hammers.

**Table 5**

**Permissible Noise Exposures**

<table>
<thead>
<tr>
<th>Duration per day, in hours</th>
<th>Sound level in dB*</th>
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<tr>
<td>8</td>
<td>90</td>
</tr>
<tr>
<td>6</td>
<td>92</td>
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<td>4</td>
<td>95</td>
</tr>
<tr>
<td>3</td>
<td>97</td>
</tr>
<tr>
<td>2</td>
<td>100</td>
</tr>
<tr>
<td>11/2</td>
<td>102</td>
</tr>
<tr>
<td>1</td>
<td>105</td>
</tr>
<tr>
<td>1/2</td>
<td>110</td>
</tr>
<tr>
<td>1/4 or less</td>
<td>115</td>
</tr>
</tbody>
</table>

*When measured on the A scale of a standard sound level meter at slow response.

Source: 29 CFR 1910.95, Table G-16.
If engineering and work practice controls do not lower employee exposure to workplace noise to acceptable levels, employees must wear appropriate hearing protection. It is important to understand that hearing protectors reduce only the amount of noise that gets through to the ears. The amount of this reduction is referred to as attenuation, which differs according to the type of hearing protection used and how well it fits. Hearing protectors worn by employees must reduce an employee’s noise exposure to within the acceptable limits noted in Table 5. Refer to Appendix B of 29 CFR 1910.95, Occupational Noise Exposure, for detailed information on methods to estimate the attenuation effectiveness of hearing protectors based on the device’s noise reduction rating (NRR). Manufacturers of hearing protection devices must display the device’s NRR on the product packaging. If employees are exposed to occupational noise at or above 85 dB averaged over an eight-hour period, the employer is required to institute a hearing conservation program that includes regular testing of employees’ hearing by qualified professionals. Refer to 29 CFR 1910.95(c) for a description of the requirements for a hearing conservation program.

Some types of hearing protection include:

- **Single-use earplugs** are made of waxed cotton, foam, silicone rubber or fiberglass wool. They are self-forming and, when properly inserted, they work as well as most molded earplugs.

- **Pre-formed or molded earplugs** must be individually fitted by a professional and can be disposable or reusable. Reusable plugs should be cleaned after each use.

- **Earmuffs** require a perfect seal around the ear. Glasses, facial hair, long hair or facial movements such as chewing may reduce the protective value of earmuffs.

**OSHA Assistance**

OSHA can provide extensive help through a variety of programs, including technical assistance about effective safety and health programs, state plans, workplace consultations, voluntary pro-tection programs, strategic partnerships, training and education, and more. An overall commitment to workplace safety and health can add value to your business, to your workplace and to your life.
Safety and Health Program Management Guidelines

Effective management of employee safety and health protection is a decisive factor in reducing the extent and severity of work-related injuries and illnesses and their related costs. In fact, an effective safety and health program forms the basis of good employee protection, can save time and money, increase productivity, and reduce employee injuries, illnesses and related workers' compensation costs.

To assist employers and employees in developing effective safety and health programs, OSHA published recommended Safety and Health Program Management Guidelines (54 Federal Register (16): 3904-3916, January 26, 1989). These voluntary guidelines apply to all places of employment covered by OSHA.

The guidelines identify four general elements critical to the development of a successful safety and health management system:
- Management leadership and employee involvement,
- Worksite analysis,
- Hazard prevention and control, and
- Safety and health training.

The guidelines recommend specific actions, under each of these general elements, to achieve an effective safety and health program. The Federal Register notice is available online at www.osha.gov.

State Programs

The Occupational Safety and Health Act of 1970 (OSH Act) encourages states to develop and operate their own job safety and health plans. OSHA approves and monitors these plans. Twenty-four states, Puerto Rico, and the Virgin Islands currently operate approved state plans: 22 cover both private and public (state and local government) employment; Connecticut, New Jersey, New York and the Virgin Islands cover the public sector only. States and territories with their own OSHA-approved occupational safety and health plans must adopt standards identical to, or at least as effective as, the Federal OSHA standards.
Consultation Services

Consultation assistance is available on request to employers who want help in establishing and maintaining a safe and healthful workplace. Largely funded by OSHA, the service is provided at no cost to the employer. Primarily developed for smaller employers with more hazardous operations, the consultation service is delivered by state governments employing professional safety and health consultants. Comprehensive assistance includes an appraisal of all mechanical systems, work practices and occupational safety and health hazards of the workplace and all aspects of the employer’s present job safety and health program. In addition, the service offers assistance to employers in developing and implementing an effective safety and health program. No penalties are proposed or citations issued for hazards identified by the consultant. OSHA provides consultation assistance to the employer with the assurance that his or her name and firm and any information about the workplace will not be routinely reported to OSHA enforcement staff.

Under the consultation program, certain exemplary employers may request participation in OSHA’s Safety and Health Achievement Recognition Program (SHARP). Eligibility for participation in SHARP includes receiving a comprehensive consultation visit, demonstrating exemplary achievements in workplace safety and health by abating all identified hazards, and developing an excellent safety and health program.

Employers accepted into SHARP may receive an exemption from programmed inspections (not complaint or accident investigation inspections) for a period of one year. For more information concerning consultation assistance, see the OSHA website at www.osha.gov.

Voluntary Protection Programs (VPP)

Voluntary Protection Programs and on-site consultation services, when coupled with an effective enforcement program, expand employee protection to help meet the goals of the OSH Act. The VPPs motivate others to achieve excellent safety and health results in the same outstanding way as they establish a cooperative relationship between employers, employees and OSHA.

For additional information on VPP and how to apply, contact the OSHA regional offices listed at the end of this publication.
Strategic Partnership Program

OSHA’s Strategic Partnership Program, the newest member of OSHA’s cooperative programs, helps encourage, assist and recognize the efforts of partners to eliminate serious workplace hazards and achieve a high level of employee safety and health. Whereas OSHA’s Consultation Program and VPP entail one-on-one relationships between OSHA and individual worksites, most strategic partnerships seek to have a broader impact by building cooperative relationships with groups of employers and employees. These partnerships are voluntary, cooperative relationships between OSHA, employers, employee representatives and others (e.g., trade unions, trade and professional associations, universities and other government agencies).

For more information on this and other cooperative programs, contact your nearest OSHA office, or visit OSHA’s website at www.osha.gov.

Alliance Program

Through the Alliance Program, OSHA works with groups committed to safety and health, including businesses, trade or professional organizations, unions and educational institutions, to leverage resources and expertise to develop compliance assistance tools and resources and share information with employers and employees to help prevent injuries, illnesses and fatalities in the workplace.

Alliance program agreements have been established with a wide variety of industries including meat, apparel, poultry, steel, plastics, maritime, printing, chemical, construction, paper and telecommunications. These agreements are addressing many safety and health hazards and at-risk audiences, including silica, fall protection, amputations, immigrant workers, youth and small businesses. By meeting the goals of the Alliance Program agreements (training and education, outreach and communication, and promoting the national dialogue on workplace safety and health), OSHA and the Alliance Program participants are developing and disseminating compliance assistance information and resources for employers and employees such as electronic assistance tools, fact sheets, toolbox talks, and training programs.
OSHA Training and Education

OSHA area offices offer a variety of information services, such as compliance assistance, technical advice, publications, audiovisual aids and speakers for special engagements. OSHA's Training Institute in Arlington Heights, IL, provides basic and advanced courses in safety and health for Federal and state compliance officers, state consultants, Federal agency personnel, and private sector employers, employees and their representatives.

The OSHA Training Institute also has established OSHA Training Institute Education Centers to address the increased demand for its courses from the private sector and from other federal agencies. These centers include colleges, universities and nonprofit training organizations that have been selected after a competition for participation in the program.

OSHA also provides funds to nonprofit organizations, through grants, to conduct workplace training and education in subjects where OSHA believes there is a lack of workplace training. Grants are awarded annually. Grant recipients are expected to contribute 20 percent of the total grant cost.

For more information on grants, training and education, contact the OSHA Training Institute, Directorate of Training and Education, 2020 South Arlington Heights Road, Arlington Heights, IL 60005, (847) 297-4810 or see Training on OSHA's website at www.osha.gov. For further information on any OSHA program, contact your nearest OSHA regional office listed at the end of this publication.

Information Available Electronically

OSHA has a variety of materials and tools available on its website at www.osha.gov. These include electronic compliance assistance tools, such as Safety and Health Topics Pages, eTools, Expert Advisors; regulations, directives, publications and videos; and other information for employers and employees. OSHA's software programs and compliance assistance tools walk you through challenging safety and health issues and common problems to find the best solutions for your workplace.

A wide variety of OSHA materials, including standards, interpretations, directives, and more can be purchased on CD-ROM from the U.S. Government Printing Office, Superintendent of Documents, toll-free phone (866) 512-1800.
OSHA Publications

OSHA has an extensive publications program. For a listing of free or sales items, visit OSHA’s website at www.osha.gov or contact the OSHA Publications Office, U.S. Department of Labor, 200 Constitution Avenue, NW, N-3101, Washington, DC 20210. Telephone (202) 693-1888 or fax to (202) 693-2498.

Contacting OSHA

To report an emergency, file a complaint or seek OSHA advice, assistance or products, call (800) 321-OSHA or contact your nearest OSHA regional or area office listed at the end of this publication. The teletypewriter (TTY) number is (877) 889-5627.

Written correspondence can be mailed to the nearest OSHA Regional or Area Office listed at the end of this publication or to OSHA’s national office at: U.S. Department of Labor, Occupational Safety and Health Administration, 200 Constitution Avenue, N.W., Washington, DC 20210.

By visiting OSHA’s website at www.osha.gov, you can also:
• File a complaint online,
• Submit general inquiries about workplace safety and health electronically, and
• Find more information about OSHA and occupational safety and health.
OSHA Regional Offices

Region I
(CT,* ME, MA, NH, RI, VT*)
JFK Federal Building, Room E340
Boston, MA 02203
(617) 565-9860

Region II
(NJ,* NY,* PR,* VI*)
201 Varick Street, Room 670
New York, NY 10014
(212) 337-2378

Region III
(DE, DC, MD,* PA,* VA,* WV)
The Curtis Center
170 S. Independence Mall West
Suite 740 West
Philadelphia, PA 19106-3309
(215) 861-4900

Region IV
(AL, FL, GA, KY,* MS, NC,* SC,* TN*)
61 Forsyth Street, SW, Room 6T50
Atlanta, GA 30303
(404) 562-2300

Region V
(IL, IN,* MI,* MN,* OH, WI)
230 South Dearborn Street, Room 3244
Chicago, IL 60604
(312) 353-2220

Region VI
(AR, LA, NM,* OK, TX)
525 Griffin Street, Room 602
Dallas, TX 75202
(972) 850-4145
Region VII
(IA,* KS, MO, NE)
Two Pershing Square
2300 Main Street, Suite 1010
Kansas City, MO 64108-2416
(816) 283-8745

Region VIII
(CO, MT, ND, SD, UT,* WY*)
1999 Broadway, Suite 1690
PO Box 46550
Denver, CO 80202-5716
(720) 264-6550

Region IX
(AZ,* CA,* HI, NV,* and American Samoa, Guam
and the Northern Mariana Islands)
90 7th Street, Suite 18-100
San Francisco, CA 94103
(415) 625-2547

Region X
(AK,* ID, OR,* WA*)
1111 Third Avenue, Suite 715
Seattle, WA 98101-3212
(206) 553-5930

* These states and territories operate their own OSHA-approved
job safety and health programs and cover state and local government
employees as well as private sector employees. The Connecticut, New
Jersey, New York and Virgin Islands plans cover public employees only.
States with approved programs must have standards that are identical to,
or at least as effective as, the Federal OSHA standards.

Note: To get contact information for OSHA Area Offices, OSHA-
approved State Plans and OSHA Consultation Projects, please visit us
online at www.osha.gov or call us at 1-800-321-OSHA.
Appendix A
OSHA Standards that Require PPE

29 CFR 1910, General Industry
Standards that Require the Employer to Provide PPE:

1910.28  Safety requirements for scaffolds
1910.66  Powered platforms for building maintenance
1910.67  Vehicle-mounted elevating and rotating work platforms
1910.94  Ventilation
1910.119 Process safety management of highly hazardous chemicals
1910.120 Hazardous waste operations and emergency response
1910.132 General requirements (personal protective equipment)
1910.133 Eye and face protection
1910.135 Occupational foot protection
1910.136 Occupational foot protection
1910.137 Electrical protective devices
1910.138 Hand protection
1910.139 Respiratory protection for M. tuberculosis
1910.157 Portable fire extinguishers
1910.160 Fixed extinguishing systems, general
1910.183 Helicopters
1910.218 Forging machines
1910.242 Hand and portable powered tools and equipment, general
1910.243 Guarding of portable power tools
1910.252 General requirements (welding, cutting and brazing)
1910.261 Pulp, paper, and paperboard mills
1910.262 Textiles
1910.268 Telecommunications
1910.269 Electric power generation, transmission and distribution
1910.333 Selection and use of work practices
1910.335 Safeguards for personnel protection
1910.1000 Air contaminants
1910.1003 13 carcinogens, etc.
1910.1017 Vinyl chloride
1910.1029 Coke oven emissions
1910.1043 Cotton dust
1910.1096 Ionizing radiation
Standards that Require the Employer to Provide PPE at No Cost to the Employee:

1910.95  Occupational noise exposure
1910.134  Respiratory protection
1910.146  Permit-required confined spaces
1910.156  Fire brigades
1910.266  Logging operations
1910.1001  Asbestos
1910.1018  Inorganic Arsenic
1910.1025  Lead
1910.1027  Cadmium
1910.1028  Benzene
1910.1030  Bloodborne pathogens
1910.1044  1,2-dibromo-3-chloropropane
1910.1045  Acrylonitrile
1910.1047  Ethylene oxide
1910.1048  Formaldehyde
1910.1050  Methyleneedianiline
1910.1051  1,3-Butadiene
1910.1052  Methylene chloride
1910.1450  Occupational exposure to chemicals in laboratories

29 CFR 1915, Shipyard Employment
Standards that Require the Employer to Provide PPE:

1915.12  Precautions and the order of testing before entering confined and enclosed spaces and other dangerous atmospheres
1915.13  Cleaning and other cold work
1915.32  Toxic cleaning solvents
1915.34  Mechanical paint removers
1915.35  Painting
1915.51  Ventilation and protection in welding, cutting and heating
1915.73  Guarding of deck openings and edges
1915.77  Working surfaces
1915.135  Powder actuated fastening tools
1915.156  Foot protection
1915.157  Hand and body protection
1915.158  Lifesaving equipment
1915.159  Personal fall arrest systems (PFAS)
Standards that Require the Employer to Provide PPE at No Cost to the Employee:

1915.154 Respiratory Protection
1915.1001 Asbestos

29 CFR 1917, Marine Terminals
Standards that Require the Employer to Provide PPE:

1917.22 Hazardous cargo
1917.25 Fumigants, pesticides, insecticides and hazardous waste
1917.26 First aid and lifesaving facilities
1917.91 Eye and face protection
1917.93 Head protection
1917.95 Other protective measures
1917.126 River banks
1917.152 Welding, cutting and heating (hot work)
1917.154 Compressed air

Standards that Require the Employer to Provide PPE at No Cost to the Employee:

1917.92 Respiratory protection

29 CFR 1918, Longshoring
Standards that Require the Employer to Provide PPE:

1918.85 Containerized cargo operations
1918.88 Log operations
1918.93 Hazardous atmospheres and substances
1918.94 Ventilation and atmospheric conditions
1918.104 Foot protection
1918.105 Other protective measures

Standards that Require the Employer to Provide PPE at No Cost to the Employee:

1918.102 Respiratory protection
29 CFR 1926, Construction

Standards that Require the Employer to Provide PPE:

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<tr>
<th>Section</th>
<th>Description</th>
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<tr>
<td>1926.28</td>
<td>Personal protective equipment</td>
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<tr>
<td>1926.52</td>
<td>Occupational noise exposure</td>
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<td>1926.57</td>
<td>Ventilation</td>
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<td>1926.64</td>
<td>Process safety management of highly hazardous chemicals</td>
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<td>Hazardous waste operations and emergency response</td>
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<td>1926.95</td>
<td>Criteria for personal protective equipment</td>
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<td>Occupational foot protection</td>
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<td>Head protection</td>
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<td>1926.300</td>
<td>General requirements (Hand and power tools)</td>
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<td>Ventilation and protection in welding, cutting and heating</td>
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<td>General requirements (Scaffolds)</td>
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<td>Duty to have fall protection</td>
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<td>Fall protection systems criteria and practices</td>
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<td>General requirements (Concrete and masonry construction)</td>
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<td>1926.1101</td>
<td>Asbestos</td>
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Standards that Require the Employer to Provide PPE at No Cost to the Employee:

1926.60    Methylenedianiline
1926.62    Lead
1926.103   Respiratory protection
1926.1127  Cadmium