

# Assessing the Need for Personal Protective Equipment: A Guide for Small Business Employers



Small Business Safety Management Series

U.S. Department of Labor  
Occupational Safety and Health Administration

OSHA 3151  
2000 (Reprinted)



## **About This Booklet**

The materials in this handbook are based upon the federal OSHA standards and other requirements in effect at the time of publication, and upon generally accepted principles and activities within the job safety and health field, but should not be considered as a substitute for the standards.

This booklet is not intended to be a legal interpretation of the provisions of the *Occupational Safety and Health Act of 1970* or to place any additional requirements on employers or employees.

The material presented herein will be useful to small business owners or managers and can be adapted to individual establishments.

All employers should be aware that there are certain states (and similar jurisdictions) which operate their own programs under agreement with the U.S. Department of Labor, pursuant to section 18 of the Act. The programs in these jurisdiction may differ in some details from the federal program.

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## Who should read this guide?

If you employ one or more persons, you should read this guide.

## How will this guide help protect my employees?

The Occupational Safety and Health Administration (OSHA) requires employers to protect their employees from workplace hazards such as machines, work procedures, and hazardous substances that can cause injury. The preferred way to do this is through engineering controls or work practice and administrative controls, but when these controls are not feasible or do not provide sufficient protection, an alternative or supplementary method of protection is to provide workers with personal protective equipment (PPE) and the know-how to use it properly.

This guide will help you to

- Examine your workplace,
- Review the work procedures you require your employees to follow,
- Select appropriate PPE (except for respirators and insulating rubber equipment) to protect your employees, and
- Teach your employees how to wear and care for the PPE you provide.

This guide will help you comply with OSHA's general PPE requirements, but it is not a substitute for OSHA standards requiring PPE (*Title 29, Code of Federal Regulations* [CFR] 1910.132).<sup>\*</sup> This standard requires employers to establish general procedures, called a PPE program, to give employees necessary protective equipment and to train them to use it properly. Respirators and insulating devices are not included in this guide because OSHA requires employers to develop separate programs specifically addressing the issues associated with those types of protective devices (29 CFR 1910.134 and 29 CFR 1910.137, respectively). Although not specifically directed to construction and maritime industry, the information, methods, and procedures in this guide are also applicable to,

and will help you comply with, OSHA's general PPE requirements for the construction industry at 29 CFR 1926.95 and for the maritime industry at 29 CFR 1915.152.

Although the checklists and other information presented in this guide are intended to help you to the greatest extent possible, please keep in mind that this publication is general in nature and does not address all workplace hazards or PPE requirements.

## What is personal protective equipment?

Personal protective equipment, or PPE, includes a variety of devices and garments to protect workers from injuries. You can find PPE designed to protect

- Eyes,
- Face,
- Head,
- Ears,
- Feet,
- Hands and arms, and
- Whole body.

PPE includes such items as

- Goggles,
- Face shields,
- Safety glasses,
- Hard hats,
- Safety shoes,
- Gloves,
- Vests,
- Earplugs, and
- Earmuffs.

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<sup>\*</sup>To obtain copies of the CFR, see the order form at the end of this publication.

Respirators and rubber insulating equipment (gloves, sleeves, blankets) are also considered PPE, but because OSHA has specific requirements for those kinds of PPE, this general guide does not address such equipment. For assistance in determining the need for and the appropriate choice of respiratory protection for your employees, see OSHA Instruction CPL 2-2.54, *Respiratory Protection Program Manual*.\*

### What is a PPE program?

This program sets out procedures for selecting, providing, and using PPE as part of your routine

operation. A written PPE program is easier to establish and maintain as company policy and easier to evaluate than an unwritten one.

### How do I develop a PPE program for my company?

You have already begun to establish a PPE program by thinking about how best to protect your employees from potential hazards. Use *Checklist A* for information on establishing a PPE program. Working through the PPE selection process in this guide will produce the foundation for your program. Then you will need to decide how to enforce PPE use at your facility, provide for any required medical examinations, and evaluate your PPE program.

#### **Checklist A:** **Establishing a PPE Program**

- Identify steps taken to assess potential hazards in every employee's work space and in workplace operating procedures
- Identify appropriate PPE selection criteria
- Identify how you will train employees on the use of PPE, including
  - What PPE is necessary
  - When PPE is necessary
  - How to properly inspect PPE for wear or damage
  - How to properly put on and adjust the fit of PPE
  - How to properly take off PPE
  - The limitations of the PPE
  - How to properly care for and store PPE
- Identify how you will assess employee understanding of PPE training
- Identify how you will enforce proper PPE use
- Identify how you will provide for any required medical examinations
- Identify how and when to evaluate the PPE program

\*CPL 2-2.54, 2/10/1992, on <http://www.osha-slc.gov/>. See **Other OSHA Documents**, at <http://www.osha.gov/> or contact your nearest OSHA regional or area office listed at the end of this publication.



## Who must provide PPE?

You must provide PPE for your employees if

- Their work environment presents a hazard or is likely to present a hazard to any part of their bodies;

**OR**

- Their work processes present a hazard or are likely to present a hazard to any part of their bodies;

**OR**

- During their work, they might come into contact with hazardous chemicals, radiation, or mechanical irritants;

**AND**

- You are unable to eliminate their exposure or potential exposure to the hazard by engineering, work practice, or administrative controls.

## How do I identify potential hazards in my workplace?

Begin with a survey of your workplace. Observe the environment in which your employees work. Ask employees how they perform their tasks. Look for sources of potential injury such as the following:

- Objects that might fall from above.
- Exposed pipes or beams at work level.
- Exposed liquid chemicals.
- Sources of heat, intense light, noise, or dust.
- Equipment or materials that could produce flying particles.

*Checklist B* at the end of this section will help you conduct this survey.

## I have identified potential hazards. Now what?

Determine if there are feasible engineering and work practice controls that could be used to avoid hazards.

### What are work practice and engineering controls?

These controls can be described by the following examples once you've identified a potential hazard on a machine or in the room in which your employees work

#### **If...**

You can physically change the machine or work environment to prevent employee exposure to the potential hazard (adding a guard to the machine or building a barrier in the room between employees and the hazard).

You can remove your employees from exposure to the potential hazard by changing the way they do their jobs.

#### **Then...**

You have eliminated the hazard with an engineering control.

You have eliminated the hazard with a work practice control.

Employers should institute all feasible engineering, work practice, and administrative controls to eliminate or reduce hazards *before* using PPE to protect employees against hazards.

**All feasible engineering and work practice controls are in place, but my employees are still exposed to potential hazards. Is now the time to provide PPE?**

Yes. You must examine each likely hazard very carefully and determine the nature of the threat the hazard poses to your employees. Then choose the appropriate PPE for protection against that hazard, and make sure that any PPE you choose will fit the employee(s) who must wear it. Next, train your employees in the proper use and care of the PPE you provide.

**How do I get started assessing my workplace operations for PPE needs?**

Use *Checklist B* to assess the work environment and procedures. Keep in mind, though, that this is

not an exhaustive list of operations that could cause injury. Many workplace operations create hazards; all of them could not be listed here. If you don't find a specific task on the checklist

- Look for similarities between your workplace operations and those listed here
- Try to anticipate whether such operations also might create similar hazards, and
- Remember, an operation need only have the *potential* to cause injury to require PPE.

Once you have identified the tasks that require PPE, read the specific sections in the checklist to help you choose the appropriate PPE for your employees.

## Machine Shop

In a machine shop, a milling operation produces large quantities of metal chips that fly all over the surrounding work areas. Recognizing that flying metal chips were a potential hazard to employees in the surrounding areas, the machine shop owner had to decide how best to protect the workers.

**Option 1—PPE:**

Provide employees with safety goggles or safety glasses with side shields.




**Option 2—Engineering and administrative controls:**

Enclose the milling operation or install a deflector to contain the metal chips and prevent them from flying into the surrounding areas (engineering control).

Operate the machine only at certain times of the day when adjacent operations have stopped (administrative/work practice control).

Option 2 is more effective since enclosing the operation will eliminate the hazard of flying metal chips. Providing a deflector will contain most, if not all, of the flying chips. In a machine shop, however, safety glasses should also be required for added protection.



**Checklist B:  
Need for PPE**

Suggested Questions	Typical Operations of Concern	Yes	No
 <b>Eyes</b>			
Do employees perform tasks, or work near employees who perform tasks, that might produce airborne dust or flying particles?	Sawing, cutting, drilling, sanding, grinding, hammering, chopping, abrasive blasting, and punch press operations.	<input type="checkbox"/>	<input type="checkbox"/>
Do your employees handle, or work near employees who handle, hazardous liquid chemicals or encounter blood splashes?	Pouring, mixing, painting, cleaning, syphoning, dip tank operations, and dental and health care services.	<input type="checkbox"/>	<input type="checkbox"/>
Are your employees' eyes exposed to other potential physical or chemical irritants?	Battery charging, installing fiberglass insulation, and compressed air or gas operations.	<input type="checkbox"/>	<input type="checkbox"/>
Are your employees exposed to intense light or lasers?	Welding, cutting, and laser operations.	<input type="checkbox"/>	<input type="checkbox"/>
 <b>Face</b>			
Do your employees handle, or work near employees who handle, hazardous liquid chemicals?	Pouring, mixing, painting, cleaning, syphoning, and dip tank operations.	<input type="checkbox"/>	<input type="checkbox"/>
Are your employees' faces exposed to extreme heat?	Welding, pouring molten metal, smithing, baking, cooking, and drying.	<input type="checkbox"/>	<input type="checkbox"/>
Are your employees' faces exposed to other potential irritants?	Cutting, sanding, grinding, hammering, chopping, pouring, mixing, painting, cleaning, and syphoning.	<input type="checkbox"/>	<input type="checkbox"/>
 <b>Head</b>			
Might tools or other objects fall from above and strike your employees on the head?	Work stations or traffic routes located under catwalks or conveyor belts, construction, trenching, and utility work.	<input type="checkbox"/>	<input type="checkbox"/>

**Checklist B:  
Need for PPE (continued)**

Suggested Questions	Typical Operations of Concern	Yes	No
When your employees stand or bend, are their heads near exposed beams, machine parts, or pipes?	Construction, confined space operations, and building maintenance.	<input type="checkbox"/>	<input type="checkbox"/>
Do your employees work with or near exposed electrical wiring or components?	Building maintenance; utility work; construction; wiring; work on or near communications, computer, or other high-tech equipment; and arc or resistance welding.	<input type="checkbox"/>	<input type="checkbox"/>
 <b>Feet</b>			
Could tools, heavy equipment, or other objects roll, fall onto, or strike your employees' feet?	Construction, plumbing, smithing, building maintenance, trenching, utility work, and grass cutting.	<input type="checkbox"/>	<input type="checkbox"/>
Do your employees work with or near exposed electrical wiring or components?	Building maintenance; utility work; construction; wiring; work on or near communications, computer, or other high-tech equipment; and arc or resistance welding.	<input type="checkbox"/>	<input type="checkbox"/>
Do your employees work with explosives or in explosive atmospheres?	Demolition, explosives manufacturing, grain milling, spray painting, abrasive blasting, and work with highly flammable materials	<input type="checkbox"/>	<input type="checkbox"/>
 <b>Hands</b>			
Do your employees' hands come into contact with tools or materials that might scrape, bruise, or cut?	Grinding, sanding, sawing, hammering, and material handling.	<input type="checkbox"/>	<input type="checkbox"/>
Do your employees handle chemicals that might irritate skin, or come into contact with blood?	Pouring, mixing, painting, cleaning, syphoning, dip tank operations, and health care and dental services.	<input type="checkbox"/>	<input type="checkbox"/>
Do work procedures require your employees to place their hands and arms near extreme heat?	Welding, pouring molten metal, smithing, baking, cooking, and drying.	<input type="checkbox"/>	<input type="checkbox"/>

**Checklist B:  
Need for PPE (continued)**

Suggested Questions	Typical Operations of Concern	Yes	No
<p>Are your employees' hands and arms placed near exposed electrical wiring or components?</p>	<p>Building maintenance; utility work; construction; wiring; work on or near communications, computer, or other high-tech equipment; and arc or resistance welding.</p>	<input type="checkbox"/>	<input type="checkbox"/>
<div style="display: flex; align-items: center;">  <span><b>Body</b></span> </div>			
<p>Are your employees' bodies exposed to irritating dust or chemical splashes?</p>	<p>Pouring, mixing, painting, cleaning, syphoning, dip tank operations, machining, sawing, battery charging, installing fiberglass insulation, and compressed air or gas operations.</p>	<input type="checkbox"/>	<input type="checkbox"/>
<p>Are your employees' bodies exposed to sharp or rough surfaces?</p>	<p>Cutting, grinding, sanding, sawing, glazing, and material handling.</p>	<input type="checkbox"/>	<input type="checkbox"/>
<p>Are your employees' bodies exposed to extreme heat?</p>	<p>Welding, pouring molten metal, smithing, baking, cooking, and drying.</p>	<input type="checkbox"/>	<input type="checkbox"/>
<p>Are your employees' bodies exposed to acids or other hazardous substances?</p>	<p>Pouring, mixing, painting, cleaning, syphoning, and dip tank operations.</p>	<input type="checkbox"/>	<input type="checkbox"/>
<div style="display: flex; align-items: center;">  <span><b>Ears/Hearing</b></span> </div>			
<p>Are your employees exposed to loud noise from machines, tools, or music systems?</p>	<p>Machining, grinding, sanding, work near conveyors, pneumatic equipment, generators, ventilation fans, motors, and punch and brake presses.</p>	<input type="checkbox"/>	<input type="checkbox"/>



### When must I provide eye protection for employees?

You must provide eye protection for employees whenever they are exposed to potential eye injuries during their work if work practice or engineering controls do not eliminate the risk of injury. Some of the things that might cause eye injuries include the following:

- Dust and other flying particles, such as metal shavings or wool fibers.
- Molten metal that might splash.
- Acids and other caustic liquid chemicals that might splash.
- Blood and other potentially infectious body fluids that might splash, spray, or splatter.
- Intense light such as that created by welding arcs and lasers.

### How do I select the proper protective eyewear for employees?

Begin with the following criteria:

- Eye protection must protect against the specific hazard(s) encountered in the workplace.
- It must be reasonably comfortable to wear.
- Eye protection must not restrict vision or movement.
- Eye protection must be durable and easy to clean and disinfect.
- Eye protection must not interfere with the function of other required PPE.

In addition, the American National Standards Institute, Inc. (ANSI)\* has issued standard requirements for the design, construction, testing, and use of protective devices for eyes and face.

OSHA requires that all protective eyewear you purchase for your employees meet the requirements of ANSI Z87.1-1989 for devices purchased after July 5, 1994, and ANSI Z87.1-1968 for devices purchased before that date.\*\*

\*ANSI, 11 West 42nd St., New York, NY 10035.

\*\*ANSI, Z87.1, *Occupational and Educational Eye and Face Protection*.

### If employees wear eyeglasses with prescription lenses, may I consider these eye protection?

No. Eyeglasses designed for ordinary wear do not provide the level of protection necessary to protect against workplace hazards. Special care must be taken when choosing eye protectors for employees who wear eyeglasses with corrective lenses such as the following:

- Prescription spectacles, with side shields and protective lenses meeting the requirements of ANSI Z87.1, that also correct the individual employee's vision.
- Goggles that can fit comfortably over corrective eyeglasses without disturbing the alignment of the eyeglasses.
- Goggles that incorporate corrective lenses mounted behind protective lenses.

You also must provide protective eyewear to employees who wear contact lenses and are exposed to potential eye injury. Eye protection provided to these employees may also incorporate corrective eyeglasses. Thus, if an employee must don eyeglasses in the event of contact lens failure or loss, he or she will still be able to use the same protective eyewear.

### What kind of eye and face protectors are there? What are they for?

- **Safety spectacles.** These protective eyeglasses are made with safety frames constructed of metal and/or plastic and are fitted with either corrective or plano impact-resistant lenses. They come with and without side shields, but most workplace operations will require side shields.
- **Impact-resistant spectacles.** This eyewear can be used for moderate impact from particles produced by such jobs as carpentry, woodworking, grinding, and scaling.
- **Side shields.** These protect against particles that might enter the eyes from the side. Side shields are made of wire mesh or plastic. Eye-cup type side shields provide the best protection.



- **Goggles.** You may choose from many different types of goggles, each designed for specific hazards. Generally, goggles protect eyes, eye sockets, and the facial area immediately surrounding the eyes from impact, dust, and splashes. Some goggles fit over corrective lenses.
- **Welding shields.** Constructed of vulcanized fiber or fiberglass and fitted with a filtered lens, these protective devices are designed for the specific hazards associated with welding. Welding shields protect your employees' eyes from burns caused by infrared or intense radiant light, and they protect face and eyes from flying sparks, metal spatter, and slag chips produced during welding, brazing, soldering, and cutting. See *Table 1* for assistance in choosing the appropriate filter for your employees' tasks.
- **Laser safety goggles.** Laser safety goggles provide a range of protection against the intense concentrations of light produced by lasers. The type of laser safety goggles you choose will depend upon the equipment and operating conditions in your workplace. *Table 2* of this document and Chapter II:6, "Laser Hazards," in the *OSHA Technical Manual\** will help you select the appropriate protection for your employees.
- **Face shields.** These transparent sheets of plastic extend from the brow to below the chin across the entire width of the employee's head. Some are polarized for glare protection. Choose face shields to protect your employees' faces from nuisance dusts and potential splashes or sprays of hazardous liquids.

### Can face shields protect employees instead of goggles or protective spectacles?

Face shields do not protect employees from impact hazards. You may use however, face shields in combination with goggles or safety spectacles, to protect against impact hazards, even in the absence of dust or potential splashes, for additional protection beyond that offered by goggles or spectacles alone.

### How do I choose the correct eye protection from among all the different types?

Each kind of protective eyewear is designed to protect against specific hazards. By completing the hazard assessment of your workplace outlined in the previous section, you will identify the specific workplace hazards that pose a threat to your employees' eyes and faces. *Tables 1 through 3* and *Figure 1* will help you find the protective devices most suited for your employees and your workplace. Locate the operations and hazards most similar to those in your workplace in *Table 1* and match the number to the corresponding drawing in *Figure 1*. Welding and laser operations require lenses to be tinted to a degree sufficient to protect against the specific intensity of light present during that tasks your employees perform (see *Tables 2* and *3*).

\*TED1-0.15A, January 20, 1999. See *OSHA Technical Manual under Other OSHA Documents* at <http://www.osha.gov>. Copies of the manual may also be purchased from the Superintendent of Documents, Government Printing Office, Washington, DC 20402. The price of the subscription is \$40 and the order number is 929-060-0000-8. GPO's phone number is (202) 512-1800; the fax number is (202) 512-2250.



**Table 1.**  
**Eye and Face Protector Selection Guide**

Operation	Hazards	Recommended protectors: (numbers refer to Figure 1)
Acetylene-burning, acetylene-cutting, acetylene-welding	Sparks, harmful rays, molten metal, flying particles	7,8,9
Chemical handling	Splash, acid burns, fumes	2,10 (for severe exposure add 10 over 2)
Chipping	Flying particles	1,3,4,5,6,7A,8A
Electric (arc) welding	Sparks, intense rays, molten metal	9,11 (11 in combination with 4,5,6 in tinted lenses advisable)
Furnace operations	Glare, heat, molten metal	7,8,9 (for severe exposure add 10)
Grinding - light	Flying particles	1,3,4,5,6,10
Grinding - heavy	Flying particles	1,3,7A,8A (for severe exposure add 10)
Laboratory	Chemical splash, glass breakage	2 (10 when in combination with 4,5,6)
Machining	Flying particles	1,3,4,5,6,10
Molten metals	Heat, glare, sparks, splash	7,8 (10 in combination with 4,5,6 in tinted lenses)
Spot welding	Flying particles, sparks	1,3,4,5,6,10

Source: 29 CFR 1926.102(a)(5)

### How dark do lenses on welding helmets and goggles need to be?

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. Table 2 shows the minimum protective shade for a variety of welding, cutting, and brazing operations. To protect employees who are exposed to intense radiant energy, begin by selecting a shade too dark to see the welding zone. Then try lighter shades until you find one that allows a sufficient view of the welding zone without going below the minimum protective shade.





**Table 2.**  
**Filter Lenses for Protection Against Radiant Energy**

Operations	Electrode size in 1/32" (0.8mm)	Arc current	Minimum* protective shade
Shielded metal arc welding	<3	<60	7
	3-5	60-160	8
	5-8	160-250	10
	>8	250-550	11
Gas metal-arc welding and flux-cored arc welding		<60	7
		60-160	10
		160-250	10
		250-500	10
Gas tungsten-arc welding		<50	8
		50-150	8
		150-500	10
Air carbon arc cutting	(light)	<500	10
	(heavy)	500-1,000	11
Plasma arc welding		<20	6
		20-100	8
		100-400	10
		400-800	11
Plasma arc cutting	(light)**	<300	8
	(medium)**	300-400	9
	(heavy)**	400-800	10
Torch blazing			3
Torch soldering			2
Carbon arc welding			14
Gas welding:			
Light	<1/8	<3.2	4
Medium	1/8-1/2	3.2-12.7	5
Heavy	>1/2	>12.7	6
Oxygen cutting:			
Light	<1	<25	3
Medium	1-6	25-150	4
Heavy	>6	>150	5

Source: 29 CFR 1910.133(a)(5).

\*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.



### How do I protect employees from exposure to laser beams?

You must provide safety goggles specifically designed to protect the employees' eyes from the specific intensity of light produced by the laser. The level of protection will vary according the level of radiation emitted by the laser. If your employees are exposed to laser beams, you must determine the maximum power density, or intensity, that the lasers

can produce.\* Based on this knowledge, you must select lenses that will protect against this maximum intensity. *Table 3* shows the minimum optical density of lenses required for various laser intensities. Employers with lasers emitting radiation between two measures of power density (or light blocking capability) must provide lenses that offer protection against the higher of the two intensities.

**Table 3.**  
**Selecting Laser Safety Glass**

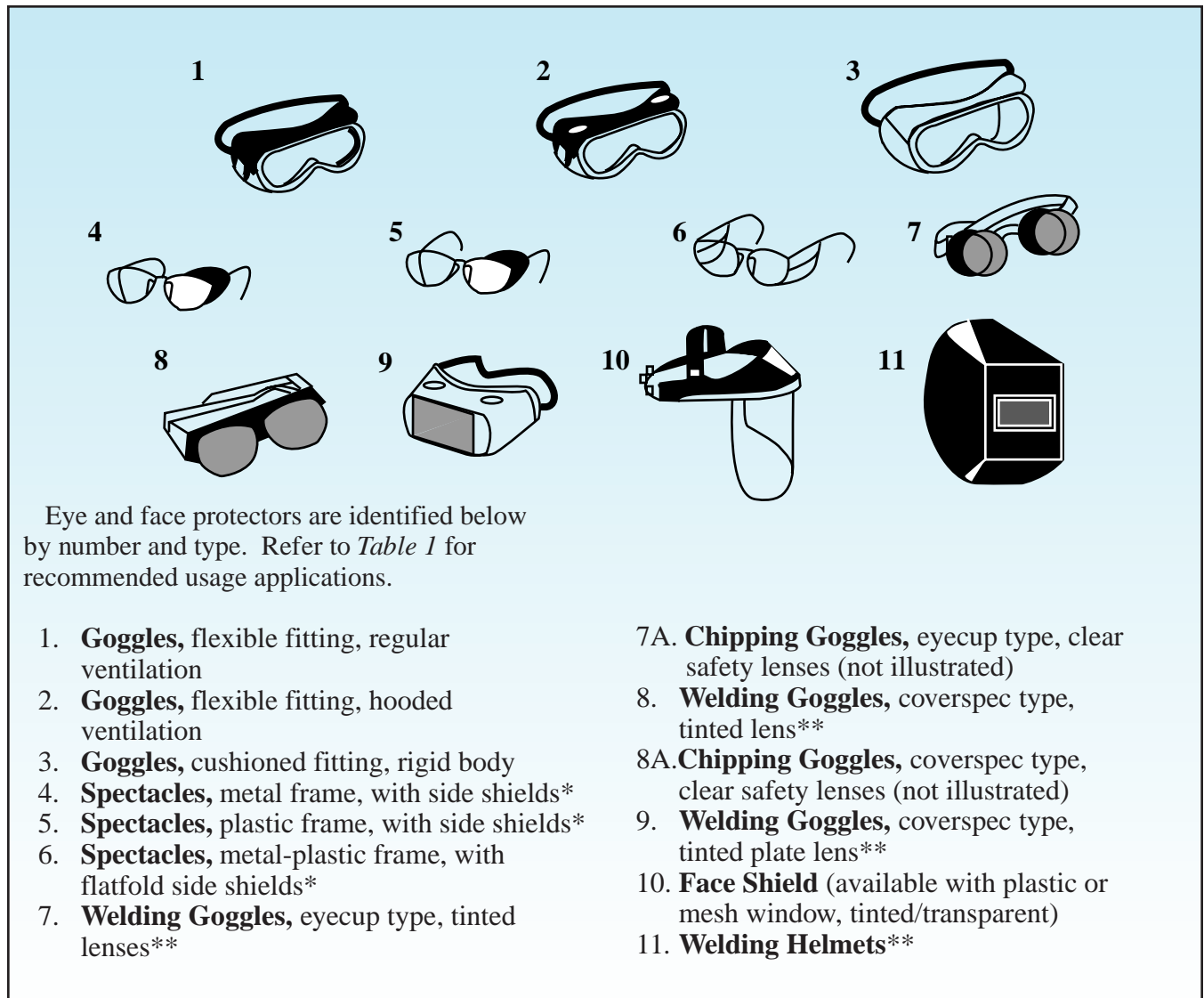
Intensity, CW maximum power density (watts/cm <sup>2</sup> )	Optical density (O.D.)	Attenuation factor
10 <sup>-2</sup>	5	10 <sup>5</sup>
10 <sup>-1</sup>	6	10 <sup>6</sup>
1	7	10 <sup>7</sup>
10	8	10 <sup>8</sup>

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

\*The manufacturer usually provides this information on the laser.



Figure 1. Recommended Eye and Face Protectors



Source: 29 CFR 1926.102 (a)(5) Table E-1.

\*These are also available without side shields for limited use requiring only frontal protection.

\*\* See Table 2, Filter Lenses for Protection Against Radiant Energy.



### How can I be sure that laser safety goggles provide enough protection?

Every pair of safety goggles intended for use with laser beams must bear a label with the following information:

- The laser wavelengths for which they are intended to be used.
- The optical density of those wavelengths.
- The visible light transmission.

### Once I have selected the appropriate eye-protection equipment, how do I make sure employees use it properly?

Train your employees to use the protective eyewear. *Checklist C* will help you prepare your employees to use and care for the eye protection you provide.

### **Checklist C:** **Use and Care of Eye and Face Protection**

#### *Train your employees to know...*

- Why eye protection is necessary—i.e., the workplace hazards that threaten their eyes
- How the eye protection will protect them
- The limitations of the eye protection
- When they must wear the eye protectors
- How to put the protective eyewear on properly
- How to adjust straps and other parts for a comfortable and effective fit
- How the protective eyewear fits over or contains an employee's corrective lenses
- How to identify signs of wear such as
  - Chipped, scratched, or scraped lenses
  - Loss of elasticity or fraying of head bands
- How to clean and disinfect the safety eyewear





### **My workplace gets pretty dirty. How will my employees keep their protective eyewear clean and effective?**

Train your employees how to clean the eye protectors. Allow them time at the end of their shifts to do the following:

- Disassemble goggles or spectacles,
- Thoroughly clean all parts with soap and warm water,
- Carefully rinse off all traces of soap, and
- Replace all defective parts.

Occasionally, you must disinfect the protective eyewear. To do so, after cleaning you can do the following:

- Immerse and swab all parts for 10 minutes in a germicidal solution.
- Remove all parts from the solution and hang in a clean place to air dry at room temperature or with heated air.
- Do not rinse the parts after submerging them in the disinfectant. Rinsing will remove the germicidal residue that remains after drying.
- You may also use ultraviolet disinfecting and spray-type disinfecting solutions after washing.

### **My employees work in shifts. Could I provide one pair of protective eyewear for each position instead of each employee?**

Yes. If you do this, however, you must disinfect shared protective eyewear after each use. If the goggles or spectacles do not have to be individually designed to incorporate an employee's corrective lenses and you disinfect the eyewear between uses by different employees, more than one employee may use the same set of protective eyewear.

### *If a Wood Chip Chips...*

Eight employees work four at a time during two shifts in a custom woodworking shop. During the course of their shifts, the employees might saw, lathe, sand, and finish wood.

Before beginning shop operations, their employer conducted a hazard assessment and determined that flying sawdust and wood chips presented an impact hazard to workers' eyes. In addition, stains, polyurethane finishes, and liquid waxes might splash into employees' eyes.

The employer purchased four flexible-fitting, ventilated goggles to be shared by employees on different shifts. The employer trained each employee to use and care for the goggles and required the employees to wear them when in the shop. In addition, the employer made face shields available for employee comfort and added protection.

During the final 15 minutes of each shift, employees wash the goggles they wore in warm water and soap. After rinsing the goggles clean, the employees douse them in disinfecting solution for 10 minutes and then place them under a blower to dry before the next shift arrives to don the goggles.



## When do my employees need head protection?

You must provide head protection for your employees if:

- 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
- They work near exposed electrical conductors.

## What should I look for in head protection?

In general, protective helmets, or hard hats, should

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

Hard hats require a hard outer shell and a shock-absorbing lining. The lining should incorporate a head band and straps that suspend the shell from 1 to 1 $\frac{1}{4}$  inches (2.54 cm to 3.18 cm) away from the user's head. This design provides shock absorption during impact and ventilation during wear.

**Figure 2. Hard Hat**



As with devices designed to protect eyes, the design, construction, testing, and use of protective helmets must meet standards established by ANSI. Protective helmets purchased after July 5, 1994, must comply with ANSI Z89.1-1986,\* whereas, those purchased before this date must meet the ANSI Z89.1-1969 standard.

## What types of head protection are available?

Hard hats are divided into three industrial classes:

- **Class A.** These helmets are for general service. They provide good impact protection but limited voltage protection. They are used mainly in mining, building construction, shipbuilding, lumbering, and manufacturing.
- **Class B.** Choose Class B helmets if your employees are engaged in electrical work. They protect against falling objects and high-voltage shock and burns.
- **Class C.** Designed for comfort, these light-weight helmets offer limited protection. They protect workers from bumping against fixed objects but do not protect against falling objects or electric shock.

Look at the inside of any protective helmet you are considering for your employees, and you should see a label showing the manufacturer's name, the ANSI standard it meets, and its class. *Figure 2* shows the basic design of hard hats.

\*ANSI Z89.1, *Protective Headwear for Industrial Workers*.



### *The Sky is Falling...*

An employer contracted with cable television providers to string coaxial cable on utility poles. The employer hired work crews of two. Generally, one employee worked aloft in an aerial lift, or cherry picker, while the other employee worked at ground level. Employees alternated these tasks.

The employer's assessment determined that, among other hazards, certain aspects of the work posed a potential for head injuries.

Ground-level employees risked being struck by falling tools from the work basket above, as well as from the basket and the lift boom when they maneuvered into position. Employees aloft risked impact with utility poles and high-voltage electrical transformers.

Employees with long hair faced additional hazards. On the ground, long hair could get tangled in lift machinery. On the lift, the wind could blow long hair and tangle it with cables and electrical hazards.

To protect employees' heads, the employer provided Class B hard hats. These helmets protect against impact and contact with electrical hazards. The employer also issued bandanas of sufficient size to cover the long hair of employees.

As part of initial training, the employer introduced all new employees to the reasons why they must wear hard hats and the procedures for the proper care and maintenance of the hard hats. In addition, the employer periodically reviews these procedures with employees during refresher training sessions.

### **How do I choose the correct protective helmets from among the different types?**

Each kind of protective helmet is designed to protect against specific hazards. By completing the hazard assessment outlined above, you will identify the specific workplace hazards that pose a threat to your employee's head.

### **I have purchased new hard hats that meet the ANSI requirements. Have I fulfilled my responsibility to protect my employees' heads?**

No. Issuing appropriate head protection to employees is a major first step, but you must make sure that the hard hats continue to provide sufficient protection to your employees. Do this by training your employees in the proper use and maintenance of hard hats including daily inspection of them. If your employees identify any of the following defects, remove the hard hats from service:

- The suspension system shows signs of deterioration such as:
  - Cracking,
  - Tearing, or
  - Fraying.
- The suspension system no longer holds the shell from 1 inch to 1 $\frac{1}{4}$  inches (2.54cm - 3.18cm) away from the employee's head.
- The brim or shell is cracked, perforated, or deformed.
- The brim or shell shows signs of exposure to heat, chemicals, ultraviolet light, or other radiation. Such signs include:
  - Loss of surface gloss,
  - Chalking, or
  - Flaking (a sign of advanced deterioration).



### Could employees wearing hard hats and working at elevations create a potential hazard for the employees working below?

To protect employees working below, you must provide chin straps for the protective helmets worn by employees working at higher elevations, whether in an aerial lift or at the edge of a pit. The chin straps should be designed to prevent the hard hats from being bumped off the employees' heads.

### Can I require employees to cut their hair if it is long enough to get tangled in machinery?

Long hair (longer than four inches) can be drawn into machine parts such as chains, belts, rotating devices, suction devices, and blowers. Hair may even be drawn into machines otherwise guarded with mesh. Although you *need not* require your employees to cut their hair, you *must* require them to *cover and protect* their hair with bandanas, hair nets, turbans, soft caps, or the like. These items, however, must not themselves present a hazard.

### Once I have selected helmets to protect my employees' heads, how do I make sure they use them properly?

Train your employees to use the hard hats. *Checklist D* will help you instruct your employees to use and care for the head protection you provide.

### How do I make sure that the hard hats I provide will be kept in good condition?

You must train your employees to maintain and care for the head protection. Your training communicates the importance of wearing head protection and taking proper care of it. Important information you will want to consider when training employees on how to care for their hard hats includes the following:

- Paints, paint thinners, and some cleaning agents can weaken the shell of the hard hat and may eliminate electrical resistance. Consult the helmet manufacturer for information on the effects of paint and cleaning materials on their hard hats. Keep in mind that paint and stickers can also hide signs of deterioration in the hard hat shell. Limit their use.
- Ultraviolet light and extreme heat, such as that generated by sunlight, can reduce the strength of the hard hats. Therefore, employees should not store or transport hard hats on the rear-window shelves of automobiles or otherwise in direct sunlight.

Also, instruct employees to clean the protective helmets periodically by:

- Immersing for one minute in hot (approximately 140° F, or 60° C) water and detergent,
- Scrubbing, and
- Rinsing in clear hot water.





### **Checklist D: Use and Care of Head Protection**

#### ***Train your employees to know...***



- Why head protection is necessary—i.e., the workplace hazards threatening their heads
  - How the head protection will protect them
  - The limitations of the head protection
  - When they must wear the head protection
  - How to wear the protective head gear properly
  - How to adjust straps and other parts for a comfortable and effective fit
- How to identify signs of wear, such as
- Cracked, torn, frayed, or otherwise deteriorated suspension systems
  - Deformed, cracked, or perforated brims or shells
  - Flaking, chalking, or loss of surface gloss
- How to clean and disinfect the hard hats you provide for them.



## When must I provide foot and leg protection?

You must provide foot and leg protection if your workplace hazard assessment reveals potential dangers to these parts of the body. Some of the potential hazards you might identify include the following:

- Heavy objects such as barrels or tools that might roll onto or fall on employees' feet.
- Sharp objects such as nails or spikes that might pierce the soles or uppers of ordinary shoes.
- Molten metal that might splash on feet or legs.
- Hot or wet surfaces.
- Slippery surfaces.

## What are the types of protection and where do I use them?

The type of foot and leg protection you provide your employees will depend upon the specific workplace hazards you identify and the specific parts of the feet or legs exposed to potential injury. Safety footwear must meet minimum compression and impact performance standards and testing requirements established by ANSI. Protective footwear purchased after July 5, 1994, must meet the requirements of ANSI Z41-1991.\* Protective footwear bought before that date

must comply with ANSI Z41-1967. Foot and leg protection choices includes the following:

- **Leggings.** Use these to protect the lower legs and feet from heat hazards, like molten metal or welding sparks. Safety snaps allow leggings to be removed quickly.
- **Metatarsal guards.** Made of aluminum, steel, fiber, or plastic, these guards may be strapped to the outside of shoes to protect the instep area from impact and compression.
- **Toe guards.** Toe guards may be made of steel, aluminum, or plastic. They fit over the toes of regular shoes. These guards protect only the toes from impact and compression hazards.
- **Combination foot and shin guards.** These guards may be used in combination with toe guards when greater protection is needed.
- **Safety shoes.** These sturdy shoes have impact-resistant toes and heat-resistant soles that protect 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 workers from workplace electrical hazards.

### A Shoe Thing...

A small foundry employs workers to cast metal rods. Although engineering controls and work practice procedures eliminated most employee exposure to molten metal, a hazard assessment conducted by the employer revealed that during pouring, spatters of the molten metal could reach employees' legs and feet. In addition, the wheels of the material handling equipment that lift the rods pass near employee work areas and constitute a compression hazard to employees' feet.

The employer provided employees with leggings and foundry shoes. The leggings fit over the shoes and provide protection against molten metal spatters to the employees' legs, while the shoes keep the burning material from making contact with employees' feet. The mandatory safety toes built into the foundry shoes provide protection against the possibility that heavy machinery could injure employees if it rolls onto their feet.

The employer also trained employees to use and care for the protective gear properly, according to the manufacturers' instructions.

\* ANSI Z41, *Protective Footwear*.



### What should I look for when choosing safety shoes for my employees?

Generally, safety shoes must be sturdy and must have impact-resistant safety toes, instep protection, and heat-resistant soles (see *Figure 3*). All safety shoes must comply with the ANSI standard(s) mentioned above. In addition, depending on the types of worker exposures, you may need to provide specially designed safety shoes such as conductive or electrical-hazard safety shoes.

#### *Conductive Shoes*

**Electrically conductive** shoes protect against the buildup of static electricity. Essentially, these shoes ground the employees wearing them. 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 an employee's body that could produce a spark and cause an explosion or fire. During training, employees must be instructed not to use foot powder or wear socks made of silk, wool, or nylon with conductive shoes. Foot powder insulates and retards the conductive ability of the shoes. Silk, wool, and nylon produce static electricity.

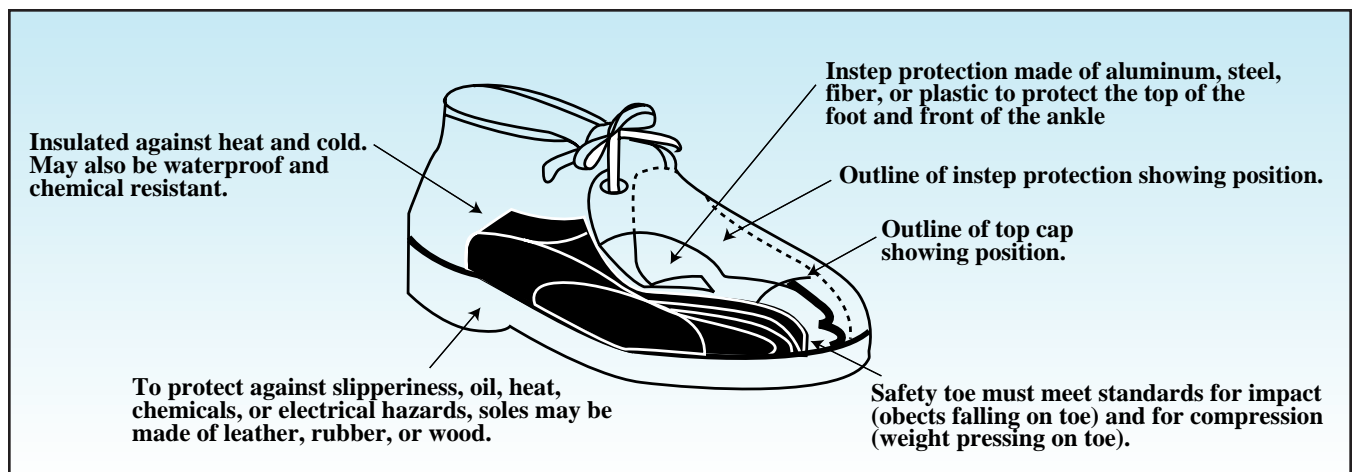
Conductive shoes are not general-purpose shoes and must be removed upon completion of the tasks for which they are required. Employees exposed to electrical hazards must never wear conductive shoes.

#### *Electrical Hazard, Safety-Toe Shoes*

Electrical hazard, safety-toe shoes are **nonconductive** and will prevent your employees' feet from completing an electrical circuit to the ground. They can protect employees against open circuits of up to 600 volts in dry conditions. Electrical hazard,

<i>If your employees...</i>	<i>Then...</i>
Work near explosive or hazardous atmosphere.	You must provide them with conductive shoes.
Work near exposed electrical conductors or components.	You must provide them with electrical-hazard, safety-toe shoes.
Work with molten metal.	You must provide them with foundry shoes.

**Figure 3. Safety Shoes**





safety-toe shoes should be used in conjunction with other insulating equipment and precautions to reduce or eliminate the potential for your employees' bodies or parts of their bodies to provide a path for hazardous electrical energy. *Note:* **Nonconductive** footwear must **not** be used in explosive or hazardous locations; in such locations, **electrically conductive** shoes are required.

Train your employees to recognize that the insulating protection of electrical hazard, safety-toe shoes may be compromised if

- The shoe is wet,
- The rubber sole is worn through,
- Metal particles become embedded in the sole or heel, or
- Other parts of the employees' bodies come into contact with conductive, grounded items.

### **Checklist E: Use and Care of Foot and Leg Protection**

#### *Foundry Shoes*

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

### **Once I have selected equipment to protect my employees' feet and legs, how do I make sure they use it properly?**

Train your employees to use the protective footwear. *Checklist E* will help you instruct your employees to use and care for the foot and leg protection you provide.

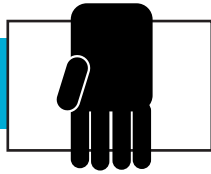
#### *Train your employees to know...*

- Why foot or leg protection is necessary—i.e., the workplace hazards that threaten the feet or legs
- How the equipment you provide will protect your employees
- The limitations of the foot or leg protection
- When employees must wear the protective leggings, guards, or shoes
- How to properly put on the protective equipment
- How to adjust straps, laces, and other parts for a comfortable and effective fit

How to identify signs of wear such as

- Scuffed, cracked, or lacerated uppers
- Signs of separation between soles and uppers
- Holes or cracks in soles or heel
- Metal embedded in heels or soles of electrical hazard, safety-toe shoes
- How to clean and maintain the leg and foot protection you provide





### When must I provide hand and arm protection?

If your workplace hazard assessment reveals that your employees risk injury to their hands and arms, and engineering and work practice controls do not eliminate the hazards, you must provide your employees with appropriate protection. The injuries you may need to guard against in your workplace include the following:

- Burns
- Bruises
- Abrasions
- Cuts
- Punctures
- Fractures
- Amputations
- Chemical exposures.

### What kind of equipment is necessary to protect the hands and arms?

For many workplace operations, machine guards such as point-of-operation guards will be sufficient. For example, install a barrier that makes it impossible for employees to put their hands at the point where a table saw blade makes contact with the wood it cuts. For other hazardous operations, you may be able to institute work procedures that eliminate the risk of injury to your employees' hands or arms. When such measures fail to eliminate the hazard, however, protective gloves will be the primary means of protecting employees' hands. When the risk of injury includes the arm, protective sleeves, often attached to the gloves, may be appropriate.

### Is there one kind of glove that will protect against all workplace hazards?

No. The nature of the hazard(s) and the operation to be performed will determine your selection of gloves. The variety of potential occupational hand injuries may make selecting the appropriate pair of gloves more difficult than choosing other protective equipment. Take care to choose gloves designed for the particular circumstances of your workplace.

### What kinds of protective gloves are available?

Gloves made from a wide variety of materials are designed for virtually every workplace hazard. In general, however, they may be divided into four groups:

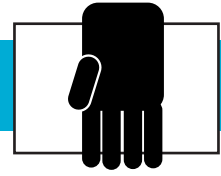
- Durable work gloves made of metal mesh, leather, or canvas.
- Fabric and coated fabric gloves.
- Chemical and liquid resistant gloves.
- Insulating rubber gloves.\*

#### *Metal Mesh, Leather, or Canvas Gloves*

Sturdy gloves made from metal mesh, leather, or canvas provide protection against cuts, burns, and sustained heat.

- **Leather gloves.** Leather gloves protect against sparks, moderate heat, blows, chips, and rough objects. Welders in particular need the durability of higher-quality leather gloves.
- **Aluminized gloves.** These gloves usually are used for welding, furnace, and foundry work because they provide reflective and insulating protection against heat. Aluminized gloves require an insert made of synthetic materials that protect against heat and cold.
- **Aramid fiber gloves.** Aramid is a synthetic material that protects against heat and cold. Many glove manufacturers use aramid fiber to make gloves that are cut- and abrasive-resistant and wear well.
- **Other synthetic materials.** Several manufacturers make gloves with other synthetic fabrics that offer protection against heat and cold. In addition to protection against temperature extremes, gloves made with other synthetic materials are cut- and abrasive-resistant and may withstand some diluted acids. These materials do not stand up against alkalis and solvents.

\*See 29 CFR 1910.137 for detailed requirements for the selection and use of insulating rubber gloves.



### Fabric and Coated Fabric Gloves

These gloves are made of cotton or other fabric to provide varying degrees of protection.

- **Fabric gloves.** These gloves can protect against dirt, slivers, chafing, and abrasion. These gloves do not provide sufficient protection, however, to be used with rough, sharp, or heavy materials.

Adding a plastic coating to some fabric gloves strengthens them and makes them effective protection for a variety of tasks.

- **Coated fabric gloves.** Manufacturers normally make these gloves from cotton flannel with napping on one side. By coating the unnapped 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 rope to handling chemical containers in laboratory operations. 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 the specific chemicals and conditions in the workplace.

### Chemical- and Liquid-Resistant Gloves

Gloves made of rubber (latex, nitrile, or butyl), plastic, or synthetic rubber-like material such as

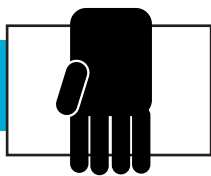
neoprene protect workers from burns, irritation, and dermatitis caused by contact with oils, greases, solvents, and other chemicals. The use of rubber gloves also reduces the risk of exposure to blood and other potentially infectious substances. Some common gloves used for chemical protection are described below. In addition, *Table 4* rates various gloves as protectors against specific chemicals and will help you select the most appropriate gloves to protect your employees.

- **Butyl rubber gloves.** These gloves protect against nitric acid, sulfuric acid, hydrofluoric acid, red fuming nitric acid, rocket fuels, and peroxide. Highly impermeable to gases, chemicals, and water vapor, butyl rubber gloves also resist oxidation and ozone corrosion. In addition, they resist abrasion and remain flexible at low temperatures.
- **Natural latex or rubber gloves.** The comfortable wear and pliability of latex gloves as well as their protective qualities make them a popular general-purpose glove. In addition to resisting abrasions caused by sandblasting, grinding, and polishing, these gloves protect workers' hands from most water solutions of acids, alkalis, salts, and ketones. When selecting hand protection, you should be aware that latex gloves have caused allergic reactions in some individuals and thus may not be appropriate for all of your employees. Hypoallergenic gloves, glove liners, and powderless gloves are possible alternatives for individuals who are allergic to latex gloves.
- **Neoprene gloves.** These gloves have good pliability, finger dexterity, high density, and tear resistance which protect against hydraulic fluids, gasoline, alcohols, organic acids, and alkalis.
- **Nitrile rubber gloves.** These sturdy gloves 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. In addition, nitrile gloves resist abrasions, punctures, snags, and tears.

#### Helping Hands...

An independent laboratory employs 25 chemists and technicians. The technicians handle small amounts of organic acids and solvents during tasks that require dexterity and accuracy. Lab coats provide sufficient protection to the technicians' arms and bodies.

The employer supplies the technicians with neoprene gloves. The gloves allow employees full dexterity and are particularly good at protecting their hands from the acids.



**Table 4.**  
**Glove Chemical Resistance Selection Chart**

Chemical	Neoprene gloves	Latex or rubber gloves	Butyl gloves	Nitrile latex gloves
Acetaldehyde*	VG	G	VG	G
Acetic acid	VG	VG	VG	VG
Acetone	G	VG	VG	P
Ammonium hydroxide	VG	VG	VG	VG
Amy acetate*	F	P	F	P
Aniline	G	F	F	P
Benzaldehyde*	F	F	G	G
Benzene*	P	P	P	F
Butyl acetate	G	F	F	P
Butyl alcohol	VG	VG	VG	VG
Carbon disulfide	F	F	F	F
Carbon tetrachloride*	F	P	P	G
Castor oil	F	P	F	VG
Chlorobenzene*	F	P	F	P
Chloroform*	G	P	P	F
Chloronaphthalene	F	P	F	F
Chromic acid (50%)	F	P	F	F
Citric acid (10%)	VG	VG	VG	VG
Cyclohexanol	G	F	G	VG
Dibutyl phthalate*	G	P	G	G
Diesel fuel	G	P	P	VG
Diisobutyl ketone	P	F	G	P
Dimethylformamide	F	F	G	G
Diethyl phthalate	G	P	F	VG
Dioxane	VG	G	G	G
Epoxy resins, dry	VG	VG	VG	VG
Ethyl acetate*	G	F	G	F
Ethyl alcohol	VG	VG	VG	VG
Ethyl ether*	VG	G	VG	G
Ethylene dichloride*	F	P	F	P
Ethylene glycol	VG	VG	VG	VG
Formaldehyde	VG	VG	VG	VG
Formic acid	VG	VG	VG	VG
Freon 11	G	P	F	G
Freon 12	G	P	F	G
Freon 21	G	P	F	G
Freon 22	G	P	F	G
Furfural*	G	G	G	G

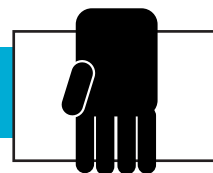
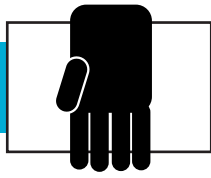


Table 4. Glove Chemical Resistance Selection Chart (Continued)

Chemical	Neoprene gloves	Latex or rubber gloves	Butyl gloves	Nitrile latex gloves
Gasoline, leaded	G	P	F	VG
Gasoline, unleaded	G	P	F	VG
Glycerin	VG	VG	VG	VG
Hexane	F	P	P	G
Hydrazine (65%)	F	G	G	G
Hydrochloric acid	VG	G	G	G
Hydrofluoric acid (48%)	VG	G	G	G
Hydrogen peroxide (30%)	G	G	G	G
Hydroquinone	G	G	G	F
Isooctane	F	P	P	VG
Kerosene	VG	F	F	VG
Ketones	V	VG	VG	P
Lacquer thinners	V	F	F	P
Lactic acid (85%)	VG	VG	VG	VG
Lauric acid (36%)	VG	F	VG	VG
Lineolic acid	VG	P	F	G
Linseed oil	VG	P	F	VG
Maleic acid	VG	VG	VG	VG
Methyl alcohol	VG	VG	VG	VG
Methylamine	F	F	G	G
Methyl bromide	G	F	G	F
Methyl chloride*	P	P	P	P
Methyl ethyl ketone*	G	G	VG	P
Methyl isobutyl ketone*	F	F	VG	P
Methyl methacrylate	G	G	VG	F
Monoethanolamine	VG	G	VG	VG
Morpholine	VG	VG	VG	G
Naphthalene	G	F	F	G
Naphthalene, aliphatic	VG	F	F	VG
Naphthalene, aromatic	G	P	P	G
Nitric acid*	G	F	F	F
Nitric acid, red and white fuming	P	P	P	P
Nitromethane (95.5%)*	F	P	F	F
Nitropropane (95.5%)	F	P	F	F
Octyl alcohol	VG	VG	VG	VG
Oleic acid	VG	F	G	VG





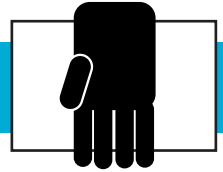
**Table 4. Glove Chemical Resistance Selection Chart (Continued)**

Chemical	Neoprene gloves	Latex or rubber gloves	Butyl gloves	Nitrile latex gloves
Oxalic acid	VG	VG	VG	VG
Palmitic acid	VG	VG	VG	VG
Perchloric acid (60%)	VG	F	G	G
Perchloroethylene	F	P	P	G
Petroleum distillates (naphtha)	G	P	P	VG
Phenol	VG	F	G	F
Phosphoric acid	VG	G	VG	VG
Potassium hydroxide	VG	VG	VG	VG
Propyl acetate	G	F	G	F
Propyl alcohol	VG	VG	VG	VG
Propyl alcohol (iso)	VG	VG	VG	VG
Sodium hydroxide	VG	VG	VG	VG
Styrene	P	P	P	F
Styrene (100%)	P	P	P	F
Sulfuric acid	G	G	G	G
Tannic acid (65)	VG	VG	VG	VG
Tetrahydrofuran	P	F	F	F
Toluene*	F	P	P	F
Toluene diisocyanate (TDI)	F	G	G	F
Trichloroethylene*	F	F	P	G
Triethanolamine (85%)	VG	G	G	VG
Tung oil	VG	P	F	VG
Turpentine	G	F	F	VG
Xylene*	P	P	P	F

Source: OSH Technical Reference Manual, U.S. Department of Energy

\*Limited service.

VG=Very Good; G=Good; F=Fair; P=Poor (not recommended).



### How do I make sure my employees properly use the equipment I have selected?

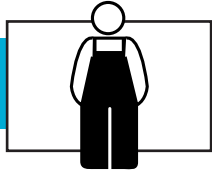
Train your employees to use the protective gloves and sleeves. *Checklist F* will help you teach your employees how to use and care for the equipment.

#### **Checklist F:** **Use and Care of Hand and Arm Protection**

##### *Train your employees to know...*



- Why hand and arm protection is necessary—i.e., the workplace hazards that threaten their hands and arms.
- How the protective gloves and sleeves will protect them
- The limitation of the protective equipment you've supplied
- When they must wear the gloves and sleeves
- How to wear the protective gloves and sleeves properly
- How to ensure a comfortable and effective fit
- How to identify signs of wear, such as
  - Cracks, scrapes, or lacerations
  - Thinning or discoloration
  - Break through to the skin
- How to clean and disinfect the nondisposable protective gloves and sleeves



### When must I provide my employees with full body protection?

You must provide body protection for employees if they are threatened with bodily injury of one kind or another while performing their jobs, and if engineering, work practice, and administrative controls have failed to eliminate these hazards. Workplace hazards that could cause bodily injury include the following:

- Intense heat
- Splashes of hot metals and other hot liquids
- Impacts from tools, machinery, and materials
- Cuts
- Hazardous chemicals
- Contact with potentially infectious materials, like blood
- Radiation.

### If only part of the body faces potential injury, must I provide my employees with full body protection?

As with all protective equipment, protective clothing is available to protect against specific hazards. You need to provide personal protective equipment only for the parts of the body exposed to possible injury. Depending upon hazards in your workplace, you may need to provide your employees with one or more of the following:

- Vests
- Jackets
- Aprons
- Coveralls
- Surgical gowns
- Full body suits.

If your hazard assessment indicates that you must provide full body protection against toxic substances or harmful physical agents, you must:

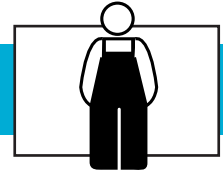
- Inspect the clothing carefully,
- Ensure proper fit, and
- Make sure the protective clothing functions properly.

### From what material should protective clothing be made?

Protective clothing comes in a variety of materials, each suited to particular hazards. Conduct your hazard assessment. Identify the sources of any possible bodily injury. Install any feasible engineering controls, and institute work practice controls to eliminate the hazards. If the possibility of bodily injury still exists, provide protective clothing constructed of material that will protect against the specific hazards in your workplace. Materials for protective clothing include the following:

- **Paperlike fiber.** Disposable suits made of this material provide protection against dust and splashes.
- **Treated wool and cotton.** Protective clothing made from treated wool and cotton adapts well to changing workplace temperatures and is comfortable as well as fire resistant. Treated cotton and wool clothing protects against dust, abrasions, and rough and irritating surfaces.
- **Duck.** This closely woven cotton fabric protects employees against cuts and bruises while they handle heavy, sharp, or rough materials.
- **Leather.** Leather protective clothing is often used against dry heat and flame.
- **Rubber, rubberized fabrics, neoprene, and plastics.** Protective clothing made from these materials protects against certain acids and other chemicals.

Be aware that different materials will protect against different chemical and physical hazards. When chemical or physical hazards are present, check with the clothing manufacturer to make sure that the material selected will provide protection from the specific chemical or physical hazards in your workplace.



## How do I make sure employees properly use the body protection I provide?

Train your employees to use the protective clothing. *Checklist G* will help you instruct them in the use and care of the body protection.

### *Avoiding the Itch...*

Among the services offered by a general contractor is the installation of fiberglass insulation. In addition to the hazards posed by airborne glass fibers from the insulation, fiberglass insulation irritates skin. Also, the insulation often is installed in attics during the summer heat.

The contractor provides employees with cotton gloves and long-sleeve cotton flannel shirts to wear while installing fiberglass insulation. The heavy cotton protects against the skin irritation while still providing as much breathability as possible.

The contractor also provides employers with respirators selected in accordance with applicable OSHA standards to protect against breathing fiberglass.

## **Checklist G:** **Use and Care of Body Protection**

### *Train your employees to know...*

- Why protective clothing is necessary—i.e., the workplace hazards that threaten their bodies
- How the protective clothing will protect them
- The limitation of the body protection
- When they must wear the protective clothing
- How to put on the protective clothing properly
- How to adjust parts for a comfortable and effective fit
- How to identify signs of wear, such as
  - Rips, tears, scuffs, and
  - Loss of elasticity in tight-fitting parts
- How to clean and disinfect the protective clothing





## When must I provide hearing protection for my employees?

Determining the need to provide hearing protection can be tricky. Employee exposure to excessive noise depends upon a number of factors:

- How loud is the noise as measured in decibels (dBA)?
- What is the duration of each employee’s exposure to the noise?
- Do employees move between separate work areas with different noise levels?
- Is noise generated from one source or multiple sources?

Generally, the louder the noise, the shorter the exposure time before you must provide hearing protection. For instance, employees may be exposed to a noise level of 90 dBA for 8 hours per day before you must provide hearing protection for them. Suppose, however, that the noise level reaches 115 dBA in your workplace. Then you must provide hearing protection if their anticipated exposure exceeds 15 minutes.

Table 5 shows when you must provide hearing protection to employees exposed to occupational noise at specific levels for specific periods. Noises are considered continuous if the interval between occurrences of the maximum noise level is 1 second or less. Noises not meeting this definition are considered impact or impulse noises. Exposure to impact or impulse noises (loud momentary explosions of sound) must not exceed 140 dB. Examples of impact or impulse noises may include the noise from a powder-actuated nail gun, the noise from a punch press, or the noise from drop hammers.

For more information on noise, consult Chapter II:5, “Noise Measurement,” of the *OSHA Technical Manual*.\*

**Table 5. Permissible Noise Exposures**

Duration per day, hours	Sound level dBA slow response
8	90
6	92
4	95
3	97
2	100
1 1/2	102
1	105
1/2	110
1/4 or less	115

Source: 29 CFR 1910.95 Table G-16.

## Will earplugs reduce employee exposure to high noise levels?

As with other types of hazards, you must implement feasible engineering controls and work practices before resorting to PPE such as earplugs or earmuffs. If engineering and work practice controls do not lower employee exposure to workplace noise to acceptable levels, then you must provide employees with appropriate PPE.

## What if my employees are exposed to different levels of noise throughout the day?

If employees move from location to location and the noise level is different in each location, or if the noise levels in an area change throughout the day (e.g., equipment turns on or off), you must calculate an “equivalent noise factor” to determine whether you must provide hearing protection.

- Measure the noise level at each location in which the employee works.
- For each noise level, find the allowable duration in Table 5.
- For each location, divide the actual time the employee spends there by the permissible duration for the noise at the measured level, according to Table 5.

\*TED 1-0.15A, January 20, 1999, on <http://www.osha-slc.gov/>.



- Add all the results from your division.
- If the total is greater than one, you must implement engineering controls or work practices or provide hearing protection to your exposed employees.

The formula for calculating this exposure is as follows:

$$F_e = (C_1/T_1) + (C_2/T_2) \dots (C_n/T_n)$$

Where

$F_e$  = the equivalent noise factor.

$C$  = the period of actual noise exposure at an essentially constant level at each location in which the employee works.

$T$  = the permissible duration of noise exposure at an essentially constant noise level, from *Table 5*.

### What kinds of devices protect against high noise levels? Is cotton sufficient as earplugs?

Plain cotton does not effectively protect against occupational noise. You may, however, choose from several products that are effective at protecting your employees' hearing.

- **Single-use earplugs.** Made of waxed cotton, foam, or fiberglass wool, these ear plugs are self-forming and, when properly inserted, work as well as most molded earplugs.
- **Preformed or molded earplugs.** Sometimes single-use and disposable, these plugs must be individually fitted by a professional. Nondisposable plugs should be cleaned after each use.
- **Earmuffs.** Earmuffs require a perfect seal around the ear. Glasses, long sideburns, long hair, and facial movements such as chewing may reduce the protective value of earmuffs. You may purchase special earmuffs designed for use with eyeglasses or beards.

### If I provide my employees with hearing protection, can they then work in areas with any level of noise for any period of time?

No. Hearing protectors reduce only the amount of noise that gets through to the ears. The amount of this reduction is referred to as attenuation. Attenuation differs according to the type of hearing protection used and how well they fit. The hearing protectors you choose must be capable of achieving the attenuation needed to reduce the employee's noise exposure to within the acceptable limits noted in *Table 5*. Appendix B of 29 CFR 1910.95, *Occupational Noise Exposure*, describes methods for estimating the attenuation of a particular hearing protector based on the device's noise reduction rating (NRR). Manufacturers of hearing protection devices must report the device's NRR on the product packaging.

### Once I have selected equipment to protect my employees' hearing, how do I make sure they use it properly?

Train your employees to use the hearing protection. *Checklist H* will help you train your employees to use and care for the earplugs or earmuffs that you provide.



### **Checklist H: Use and Care of Hearing Protection**

#### *Train your employees to know...*



- Why hearing protection is necessary—i.e., the workplace hazards that threaten their hearing
- How the earplugs or earmuffs will protect them
- The limitations of the hearing protection
- When they must insert or wear the hearing protectors
- How to adjust earmuff parts for a comfortable and effective fit, or form the earplugs to fit their ears
- How special earmuffs fit over an employee's corrective lenses
- How to clean and disinfect the hearing protection

### **Once I have provided my employees with hearing protection and training in how to use it, how do I know that it is really protecting their hearing?**

If your employees are exposed to occupational noise at or above 85 dBA averaged over an 8-hour period, then you must institute a hearing conservation program that includes regular testing of employees' hearing by qualified professionals. The OSHA occupational noise standard, at 29 CFR 1910.95, sets forth the requirements for a hearing conservation program.

You must consider many factors when selecting PPE to protect your employees from workplace hazards. With all of the types of operations that can present hazards and all of the types of PPE available to protect the different parts of a worker's body from specific types of hazards, this selection process can be confusing and at times overwhelming. Because of this, OSHA requires that you implement a PPE program to help you systematically assess the hazards in the workplace and select the appropriate PPE that will protect your workers from those hazards. As part of this PPE program, you must do the following:

- Assess the workplace to identify equipment, operations, chemicals, and other workplace components that could harm your employees.
  - Implement engineering controls and work practices to control or eliminate these hazards to the extent feasible.
  - Select the appropriate types of PPE to protect your employees from hazards that cannot be eliminated or controlled through engineering controls and work practices.
- Inform your employees why the PPE is necessary and when it must be worn.
  - Train your employees how to use and care for the selected PPE and how to recognize PPE deterioration and failure.
  - Require your employees to wear the selected PPE in the workplace.

The basic information presented here attempts to establish and illustrate a logical, structured approach to hazard assessment and PPE selection and application for you to use as a starting point for your PPE program.



## Safety and Health Program Management Guidelines

Effective management of worker safety and health protection is a decisive factor in reducing the extent and severity of work-related injuries and illnesses and their related costs. To assist employers and employees in developing effective safety and health programs, OSHA published recommended *Safety and Health Program Management Guidelines* (*Federal Register* 54 (18): 3908-3916, January 26, 1989). These voluntary guidelines apply to all places of employment covered by OSHA.

The guidelines identify four elements that are critical to the development of a successful safety and health management program:

- Management commitment and employee involvement
- Worksite analysis
- Hazard prevention and control
- Safety and health training.

The guidelines recommend specific actions under each of these general elements to achieve an effective safety and health program. A single free copy of the guidelines can be obtained from the U.S. Department of Labor, OSHA/OSHA Publications, P.O. Box 37535, Washington, DC 20013-7535, by sending a self-addressed mailing label with your request. See also **Federal Register** notices on OSHA's Web site at <http://www.osha.gov>.

## State Programs

The *Occupational Safety and Health Act of 1970* encourages states to develop and operate their own job safety and health plans. States with plans approved under section 18(b) of the Act must adopt standards and enforce requirements that are at least as effective as federal requirements. There are currently 25 state-plan states: 23 of these states administer plans covering both private and public (state and local government) employees; the other two states, Connecticut and New York, cover public employees only. Plan states must adopt standards comparable to Federal requirements within six

months of a Federal standard's promulgation. Until a state standard is promulgated, Federal OSHA provides interim enforcement assistance, as appropriate, in these states. A listing of approved state plans appears at the end of this publication.

## Free On-Site Consultation

Free on-site safety and health consultation services are available in all states to employers who want help in establishing and maintaining a safe and healthful workplace. Primarily developed for smaller employers with more hazardous operations, the OSHA Consultation Service is largely funded by OSHA and is delivered by state governments employing professional safety consultants and health consultants. The full service assistance that is offered includes an appraisal of all mechanical systems, physical work practices, 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 workplace safety and health program that corrects and continuously addresses safety and health concerns.

This program is completely separate from OSHA's inspection efforts. No penalties are proposed or citations issued for any safety or health problems identified by the consultant. The service is confidential. The employer's name, the firm's name, and any information about the workplace, plus any unsafe or unhealthful working conditions that the consultant uncovers will not be reported routinely to the OSHA inspection staff.

The only obligation is the employer's commitment to correct serious job safety and health hazards in a timely manner. The employer is asked to make this commitment prior to the actual visit.

For more information concerning consultation services, see the list of state consultation projects at the end of this publication.

## Voluntary Protection Programs (VPP)

The Voluntary Protection Programs (VPP) are designed to recognize and promote effective safety

and health program management. In the VPP, management, labor, and OSHA establish cooperative relationships at workplaces that have implemented strong programs.

Sites approved for VPP's Star, Merit, and Demonstration programs have met, and must continue to meet, rigorous participation standards. Benefits of VPP participation include improved employee motivation to work safely, leading to better quality and productivity; lost-workday case rates that generally are 60-80 percent below industry averages; reduced workers' compensation and other injury- and illness-related cost; positive community recognition and interaction; further improvement and revitalization of already good safety and health programs; and partnership with OSHA.

A valuable offshoot of the Voluntary Protection Programs is the Mentoring Program operated by the VPP Participants' Association, a private, nonprofit organization that supports the VPP's goals. Worksites that have qualified for participation in the VPP share their experience and expertise with sites that have requested help in developing and implementing effective worker safety and health programs. Information on mentoring can be obtained from the VPP Participants' Association, 7600-E Leesburg Pike, Suite 440, Falls Church, VA 22043, telephone (703) 761-1148.

Voluntary Protection Programs and on-site consultation services, when coupled with an effective enforcement program, expand worker protection to help meet the goals of the OSH Act.

For additional information about the VPP, contact the VPP Manager in your OSHA Regional Office, listed at the end of this publication.

### **Training and Education**

OSHA's area offices offer a variety of information services such as publications, audiovisual aids, technical advice, and speakers for special engagements. OSHA's Training Institute in Des Plaines, 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 are nonprofit colleges, universities, and other organizations that have been selected after a competition for participation in the program. They are located in various parts of the United States.

OSHA also provides grants to nonprofit organizations for workplace training and education in subjects where OSHA believes there is a lack of workplace training. Grants are awarded annually, and 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, Office of Training and Education, 1555 Times Drive, Des Plaines, IL 60018, telephone (847) 297-4810.

For further information on any OSHA program, contact your nearest OSHA area or regional office. A list of these offices is at the end of this publication.

### **Electronic Information**

Internet: OSHA standards, interpretations, directives, and additional information are now on the Worldwide Web at <http://www.osha.gov/>.

CD-ROM: A wide variety of OSHA materials including standards, interpretations, directives, and more can be purchased on CD-ROM from the Government Printing Office. To order, write to the Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250-7954. Specify OSHA Regulations, Documents and Technical Information on CD-ROM, (ORDT), S/N 729-013-000000-5. The price is \$46.00 per year; single copy \$17.00.

### **Emergencies**

For life-threatening situations, call (800) 321-OSHA. Complaints will go immediately to the nearest OSHA area or state office for help.

For further information on any OSHA program, contact your nearest OSHA area or regional office.

**Commissioner**

Alaska Department of Labor  
1111 West 8th Street  
Room 304  
Juneau, AK 99801-1149  
(907) 465-2700

**Director**

Industrial Commission of Arizona  
800 W. Washinagton  
Phoenix, AZ 85007-2922  
(602) 542-5795

**Director**

California Department of Industrial Relations  
455 Golder Gate Avenue-10th Floor  
San Francisco, CA 94102  
(415) 703-5050

**Commissioner**

Connecticut Department of Labor  
200 Folly Brook Boulevard  
Wethersfield, CT 06109  
(203) 566-5123

**Director**

Hawaii Department of Labor  
and Industrial Relations  
830 Punchbowl Street  
Honolulu, HI 96813  
(808) 586-8844

**Commissioner**

Indiana Department of Labor  
State Office Building  
402 West Washington Street  
Room W195  
Indianapolis, IN 46204-2751  
(317) 232-2378

**Commissioner**

Iowa Division of Labor Services  
1000 E. Grand Avenue  
Des Moines, IA 50319-0209  
(515) 281-3447

**Secretary**

Kentucky Labor Cabinet  
1049 U.S. Highway, 127 South, Suite 4  
Frankfort, KY 40601  
(502) 564-3070

**Commissioner**

Maryland Division of Labor and Industry  
Department of Labor, Licensing,  
and Regulation  
1100 N. Eutaw Street, Room 613  
Baltimore, MD 21201-2206  
(410) 767-2215

**Director**

Michigan Department of Consumer  
and Industry Services  
P.O. Box 30643  
Lansing, MI 48909-8143  
(517) 322-1814

**Commissioner**

Minnesota Department of Labor  
and Industry  
443 Lafayette Road  
St. Paul, MN 55155-4307  
(651) 296-2342

**Director**

Nevada Division of Industrial Relations  
400 West King Street  
Carson City, NV 89710  
(751) 687-3032

**Secretary**

New Mexico Environment Department  
1190 St. Francis Drive  
P.O. Box 26110  
Santa Fe, NM 87502  
(505) 827-2850

**Commissioner**

New York Department of Labor  
W. Averell Harriman State Office  
Building - 12, Room 500  
Albany, NY 12240  
(518) 457-2741

**Commissioner**

North Carolina Department of Labor  
4 West Edenton Street  
Raleigh, NC 27601-1092  
(919) 807-7166

**Administrator**

Department of Consumer & Business  
Services  
Occupational Safety and Health  
Division (OR-OSHA)  
350 Winter Street, NE, Room 430  
Salem, OR 97310-0220  
(503) 378-3272

**Secretary**

Puerto Rico Department of Labor  
and Human Resources  
Prudencio Rivera Martinez Building  
505 Munoz Rivera Avenue  
Hato Rey, PR 00918  
(809) 754-2119

**Commissioner**

South Carolina Department of Labor,  
Licensing, and Regulation  
Koger Office Park, Kingstree Building  
110 Centerview Drive  
P.O. Box 11329  
Columbia, SC 29210  
(803) 896-4300

**Commissioner**

Tennessee Department of Labor  
710 James Robertson Parkway  
Nashville, TN 37243-0659  
(615) 741-2582

**Commissioner**

Labor Commission of Utah  
160 East 300 South, 3rd Floor  
P.O. Box 146650  
Salt Lake City, UT 84114-6650  
(801) 530-6898

**Commissioner**

Vermont Department of Labor and Industry  
National Life Building - Drawer 20  
National Life Drive  
Montpelier, VT 05620-3401  
(802) 828-5098

**Commissioner**

Virginia Department of Labor and Industry  
Powers-Taylor Building  
13 South 13th Street  
Richmond, VA 23219  
(804) 786-2377

**Commissioner**

Virgin Islands Department of Labor  
2203 Church Street  
Christiansted St. Croix, VI 00820-4660  
(340) 773-1994

**Director**

Washington Department of Labor  
and Industries  
P.O. Box 44001  
Olympia, WA 98504-4001  
(360) 902-4200

**Administrator**

Worker's Safety and Compensation  
Division (WSC)  
Wyoming Department of Employment  
Herschler Building, 2nd Floor East  
122 West 25th Street  
Cheyenne, WY 82002  
(307) 777-7786

**Alabama (Region IV)**

Safe State Program  
University of Alabama  
425 Martha Parham West  
P.O. Box 870388  
Tuscaloosa, AL 35487  
(205) 348-3033

**Alaska (Region X)**

Consultation Section  
ADOL/OSHA  
3301 Eagle Street  
P.O. Box 107022  
Anchorage, AK 99510  
(907) 269-4957

**Arizona (Region IX)**

Consultation and Training  
Division of Occupational Safety & Health  
Industrial Commission of Arizona  
800 West Washington  
Phoenix, AZ 85007-9070  
(602) 542-1695

**Arkansas (Region VI)**

OSHA Consultation  
Arkansas Department of Labor  
10421 West Markham  
Little Rock, AK 72205  
(501) 682-4522

**California (Region IX)**

CAL/OSHA Consultation Service  
Department of Industrial Relations  
455 Golden Gate Avenue, 10th Floor  
San Francisco, CA 94102  
(415) 972-5270

**Colorado (Region VIII)**

Occupational Safety & Health Section  
Colorado State University  
115 Environmental Health Building  
Fort Collins, CO 80523  
(970) 491-6151

**Connecticut (Region I)**

Division of Occupational Safety & Health  
Connecticut Department of Labor  
38 Wolcott Hill Road  
Wethersfield, CT 06109  
(860) 566-4550

**Delaware (Region III)**

Occupational Safety and Health  
Division of Industrial Affairs  
Delaware Department of Labor  
4425 Market Street  
Wilmington, DE 19802  
(302) 761-8219

**District of Columbia (Region III)**

Office of Occupational Safety and Health  
D. C. Department of Employment Services  
950 Upshur Street, N.W.  
Washington, DC 20011  
(202) 576-6339

**Florida (Region IV)**

7(c)(1) Onsite Consultation Program  
Division of Safety  
Florida Department of Labor  
& Employment Security  
2002 St. Augustine Road  
Building E, Suite 45  
Tallahassee, FL 32399-0663  
(850) 922-8955

**Georgia (Region IV)**

7(c)(1) Onsite Consultation Program  
Georgia Institute of Technology  
151 6th Street, NW  
O'Keefe Building, Room 22  
Atlanta, GA 30332-0837  
(404) 894-2643

**Guam (Region IX)**

OSHA Onsite Consultation  
Department of Labor, Government of Guam  
107 F Street  
Tiyam, GU 96931  
(671) 475-0136

**Hawaii (Region IX)**

Consultation and Training Branch  
Department of Labor and Industrial Relations  
830 Punchbowl Street  
Honolulu, HI 96813  
(808) 586-9100

**Idaho (Region X)**

Safety and Health Consultation Program  
Boise State University  
Department of Health Studies  
1910 University Drive  
Boise, ID 83725  
(208) 426-3283

**Illinois (Region V)**

Illinois Onsite Consultation  
Industrial Service Division  
Department of Commerce & Community Affairs  
State of Illinois Center  
Suite 3-400  
100 West Randolph Street  
Chicago, IL 60601  
(312) 814-2337

**Indiana (Region V)**

Division of Labor  
Bureau of Safety, Education, and Training  
Room W195  
402 West Washington  
Indianapolis, IN 46204-2287  
(317) 232-2688

**Iowa (Region VII)**

7(c)(1) Consultation Program  
Iowa Bureau of Labor  
2016 DMACC Boulevard  
Building 17, Room 10  
Ankeny, IA 50021  
(515) 281-5352

**Kansas (Region VII)**

Kansas 7(c)(1) Consultation Program  
Kansas Department of Human Resources  
512 South West 6th Street  
Topeka, KS 66603-3150  
(785) 296-7476

**Kentucky (Region IV)**

Division of Education and Training  
Kentucky Labor Cabinet  
1047 U.S. Highway 127, South  
Frankfort, KY 40601  
(502) 564-6895

**Louisiana (Region VI)**

7(c)(1) Consultation Program  
Louisiana Department of Labor  
1001 N. 23rd Street, Room 230  
P.O. Box 94094  
Baton Rouge, LA 70804-9094  
(504) 342-9601

**Maine (Region I)**

Division of Industrial Safety  
Maine Bureau of Labor Standards  
Division of Industrial Safety  
State House Station #45  
Augusta, ME 04333-0045  
(207) 624-6460

**Maryland (Region III)**

MOSH Consultation Services  
312 Marshall Avenue, Room 600  
Laurel, MD 20707  
(410) 880-4970

**Massachusetts (Region I)**

Division of Occupational Safety and Health  
Department of Workforce Development  
1001 Watertown Street  
West Newton, MA 02165  
(617) 727-3982

**Michigan (Health) (Region V)**

Division of Occupational Health  
7150 Harris Drive  
P.O. Box 30649  
Lansing, MI 48909  
(517) 322-6823

**Michigan (Safety) (Region V)**

Department of Consumer and  
Industry Services  
7150 Harris Drive  
Lansing, MI 48909  
(517) 322-1809

**Minnesota (Region V)**

Department of Labor and Industry  
Consultation Division  
433 LaFayette Road  
Saint Paul, MN 55155  
(612) 297-2393

**Mississippi (Region IV)**

Mississippi State University  
Center for Safety and Health  
2906 North State Street  
Suite 201  
Jackson, MS 39216  
(601) 987-3981

**Missouri (Region VII)**

Onsite Consultation Program  
Division of Labor Standards  
Department of Labor and Industrial Relations  
3315 West Truman Boulevard  
P.O. Box 449  
Jefferson City, MO 65109  
(573) 751-3403

**Montana (Region VIII)**

Department of Labor and Industry  
Bureau of Safety  
P.O. Box 1728  
Helena, MT 59624-1728  
(406) 444-6418

**Nebraska (Region VII)**

Division of Safety and Labor Standards  
Nebraska Department of Labor  
State Office Building, Lower level  
301 Centennial Mall, South  
Lincoln, NE 68509-5024  
(402) 471-4717

**Nevada (Region IX)**

Safety Consultation and Training Section  
Division of Industrial Relations  
Department of Business and Industry  
1301 Green Valley Parkway  
Henderson, NV 89014  
(702) 486-9140

**New Hampshire (Region I)**

New Hampshire Department of Health  
and Human Services  
6 Hazen Drive  
Concord, NH 03301-6527  
(603) 271-2024

**New Jersey (Region II)**

New Jersey Department of Labor  
Division of Public Safety and  
Occupational Safety and Health  
255 E. State Street, 8th Floor West  
P.O. Box 953  
Trenton, NJ 08625-0953  
(609) 292-3923

**New Mexico (Region VI)**

New Mexico Environment Department  
Occupational Health and Safety Bureau  
525 Camino de los Marquez, Suite 3  
P.O. Box 26110  
Santa Fe, NM 87502  
(505) 827-4230

**New York (Region II)**

Division of Safety and Health  
State Office Campus  
Building 12, Room 130  
Albany, NY 12240  
(518) 457-2238

**North Carolina (Region IV)**

Bureau of Consultative Services  
North Carolina Department of Labor  
4 West Edenton Street  
Raleigh, NC 27603-1092  
(919) 807-2905

**North Dakota (Region VIII)**

Division of Environmental Engineering  
Room 304  
1200 Missouri Avenue  
Bismarck, ND 58504  
(701) 328-5188

**Ohio (Region V)**

Division of Onsite Consultation  
Bureau of Employment Services  
145 S. Front Street  
Columbus, OH 43215  
(614) 644-2246

**Oklahoma (Region VI)**

Oklahoma Department of Labor  
OSHA Division  
4001 North Lincoln Boulevard  
Oklahoma City, OK 73105-5212  
(405) 528-1500

**Oregon (Region X)**

Oregon OSHA  
Department of Consumer and  
Business Services  
350 Winter Street, N.E., Room 430  
Salem, OR 97310  
(503) 378-3272

**Pennsylvania (Region III)**

Indiana University of Pennsylvania  
Room 210 Walsh Hall  
302 East Walk  
Indiana, PA 15705-1087  
(412) 357-2396

**Puerto Rico (Region II)**

Occupational Safety and Health Office  
Department of Labor and Human Resources  
21st Floor  
505 Munoz Rivera Avenue  
Hato Rey, PR 00918  
(787) 754-2171

**Rhode Island (Region I)**

OSH Consultation Program  
Division of Occupational Health and  
Radiation Control  
Rhode Island Department of Health  
3 Capital Hill  
Providence, RI 02908  
(401) 277-2438

**South Carolina (Region IV)**

South Carolina Department of Labor, Licensing  
and Regulation  
3600 Forest Drive  
P.O. Box 11329  
Columbia, SC 29204  
(803) 734-9614

**South Dakota (Region VIII)**

Engineering Extension  
Onsite Technical Program  
South Dakota State University  
West Hall, Box 510  
907 Harvey Dunn Street  
Brookings, SD 57007  
(605) 688-4101

**Tennessee (Region IV)**

OSHA Consultative Services Division  
Tennessee Department of Labor  
3rd Floor  
710 James Robertson Parkway  
Nashville, TN 37243-0659  
(615) 741-7036

**Texas (Region VI)**

Workers' Health and Safety Division  
Workers' Compensation Commission  
Southfield Building  
4000 South I H 35  
Austin, TX 78704  
(512) 440-4640

**Utah (Region VIII)**

Utah Labor Commission  
Workplace Safety and Health  
Consultation Services  
160 East 300 South  
Salt Lake City, UT 84114-6650  
(801) 530-6901

**Vermont (Region I)**

Division of Occupational Safety and Health  
Vermont Department of Labor and Industry  
National Life Building, Drawer #20  
Montpelier, VT 05602-3401  
(802) 828-2765



**Virginia (Region III)**

Virginia Department of Labor and Industry  
Occupational Safety and Health Training  
and Consultation  
13 South 13th Street  
Richmond, VA 23219  
(804) 786-6359

**Virgin Islands (Region II)**

Division of Occupational Safety and Health  
Virgin Islands Department of Labor  
3021 Golden Rock  
Christiansted  
St. Croix, VI 00840  
(340) 772-1315

**Washington (Region X)**

Washington Department of Labor and Industries  
Division of Industrial Safety & Health  
P.O. Box 44643  
Olympia, WA 98504  
(360) 902-5638

**West Virginia (Region III)**

West Virginia Department of Labor  
Capitol Complex Building #3, Room 319  
1800 East Washington Street  
Charleston, WV 25305  
(304) 558-7890

**Wisconsin (Health) (Region V)**

Wisconsin Department of Health and  
Human Services  
Division of Public Health  
Section of Occupational Health  
Room 112  
1414 East Washington Avenue  
Madison, WI 53703  
(608) 266-8579

**Wisconsin (Safety) (Region V)**

Wisconsin Department of Commerce  
Bureau of Marketing, Advocacy, and  
Technology Development  
Bureau of Manufacturing and Assessment  
NI4 W23833 Stone Ridge Drive  
Suite B100  
Waukesha, WI 53188-1125  
(414) 523-3040

**Wyoming (Region VIII)**

Wyoming Department of Employment  
Workers' Safety and Compensation Division  
Herschler Building, 2 East  
122 West 25th Street  
Cheyenne, WY 82002  
(307) 777-7786

**Consultation Training Coordinator**

OSHA Training Institute  
1555 Times Drive  
Des Plaines, IL 60018  
(847) 297-4810

**Laboratory Services Agreement**

Wisconsin Occupational Health Lab  
979 Jonathan Drive  
Madison, WI 53713  
(608) 263-8807

**New York Public Sector Consultation Project**

New York State Department of Labor  
Building #12  
State Building Campus  
Albany, NY 12240  
(518) 457-3518

**Director of Consultation Support Services**

University of Alabama  
College of Continuing Studies  
425 Martha Parham West  
P.O. Box 870388  
Tuscaloosa, AL 35487-0388  
(205) 348-4585

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US Department of Labor - OSHA  
3737 Government Blvd., Suite 100  
Mobile, AL 36693-4309  
Telephone: (334) 441-6131

US Department of Labor - OSHA  
301 W. Northern Lights Blvd.  
Suite 407  
Anchorage, AK 99503-7571  
Telephone: (907) 271-5152

US Department of Labor - OSHA  
3221 North 16th Street, Suite 100  
Phoenix, AZ 85016  
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US Department of Labor - OSHA  
425 West Capitol  
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Little Rock, AR 72201  
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US Department of Labor - OSHA  
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San Diego, CA 92123  
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US Department of Labor - OSHA  
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San Francisco, CA 95815  
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US Department of Labor - OSHA  
1391 North Speer Boulevard  
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Denver, CO 80204-2552  
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US Department of Labor - OSHA  
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Englewood, CO 80111-2714  
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US Department of Labor - OSHA  
Clark Building  
1057 Broad Street  
Bridgeport, CT 06604  
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US Department of Labor - OSHA  
Federal Office Building  
450 Main Street, Room 613  
Hartford, CT 06103  
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US Department of Labor - OSHA  
1 Rodney Square  
920 King Street, Suite 402  
Wilmington, DE 19801-3319  
(302) 573-6115

US Department of Labor - OSHA  
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Fort Lauderdale, FL 33324  
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US Department of Labor - OSHA  
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Jacksonville, FL 32207  
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US Department of Labor - OSHA  
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Suite A  
Tampa, FL 33610-4249  
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US Department of Labor - OSHA  
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Savannah, GA 31406  
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US Department of Labor - OSHA  
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US Department of Labor - OSHA  
Building 7, Suite 110  
2183 N. Lake Parkway  
La Vista Perimeter Office Park  
Tucker, GA 30084-4154  
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US Department of Labor - OSHA  
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Honolulu, HI 96850  
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US Department of Labor - OSHA  
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Suite 201  
Boise, ID 83706  
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US Department of Labor - OSHA  
1600 167th Street, Suite 12  
Calumet City, IL 60409  
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US Department of Labor - OSHA  
2360 E. Devon Avenue  
Suite 1010  
Des Plaines, IL 60018  
Telephone: (847) 803-4800

US Department of Labor - OSHA  
11 Executive Drive, Suite 11  
Fairview Heights, IL 62208  
Telephone: (618) 632-8612

US Department of Labor - OSHA  
344 Smoke Tree Business Park  
North Aurora, IL 60542  
Telephone: (630) 896-8700

US Department of Labor - OSHA  
2918 West Willow Knolls Road  
Peoria, IL 61614  
Telephone: (309) 671-7033

US Department of Labor - OSHA  
46 East Ohio Street, Room 423  
Indianapolis, IN 46204  
Telephone: (317) 226-7290

US Department of Labor - OSHA  
210 Walnut Street, Room 815  
Des Moines, IA 50309  
Telephone: (515) 284-4794

US Department of Labor - OSHA  
300 Epic Center  
301 N. Main  
Wichita, KS 67202  
Telephone: (316) 269-6644

US Department of Labor - OSHA  
John C. Watts Federal Building, Room 108  
330 W. Broadway  
Frankfort, KY 40601-1922  
Telephone: (502) 227-7024

US Department of Labor - OSHA  
9100 Bluebonnet Centre Boulevard  
Suite 201  
Baton Rouge, LA 70809  
Telephone: (225) 389-0474

US Department of Labor - OSHA  
40 Western Avenue, Room 608  
Augusta, ME 04330  
Telephone: (207) 622-8417

US Department of Labor - OSHA  
U.S. Federal Building  
202 Harlow Street  
Room 211  
Bangor, ME 04401  
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US Department of Labor - OSHA  
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US Department of Labor - OSHA  
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Braintree, MA 02184  
Telephone: (617) 565-6924

US Department of Labor - OSHA  
Valley Office Park  
13 Branch Street  
Methuen, MA 01844  
Telephone: (617) 565-8110

US Department of Labor - OSHA  
1145 Main Street, Room 550  
Springfield, MA 01103-1493  
Telephone: (413) 785-0123

US Department of Labor - OSHA  
801 South Waverly Road  
Suite 306  
Lansing, MI 48917-4200  
Telephone: (517) 377-1892

US Department of Labor - OSHA  
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Minneapolis, MN 55415  
Telephone: (612) 664-5460

US Department of Labor - OSHA  
3780 I-55 North  
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Jackson, MS 39211-6323  
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US Department of Labor - OSHA  
6200 Connecticut Avenue, Suite 100  
Kansas City, MO 64120  
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Room 420  
St. Louis, MO 63101  
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2900 4th Avenue North, Suite 303  
Billings, MT 59101  
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Overland Wolf Building, Room 100  
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US Department of Labor - OSHA  
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Plaza 35, Suite 205  
Avenel, NJ 07001  
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US Department of Labor - OSHA  
500 Route 17 South, 2nd Floor  
Hasbrouck Heights, NJ 07604  
Telephone: (201) 288-1700

US Department of Labor - OSHA  
Marlton Executive Park  
701 Route 73 South Building 2  
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Bayside, NY 11361  
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US Department of Labor - OSHA  
5360 Genesee Street  
Bowmansville, NY 14026  
Telephone: (716) 684-3891

US Department of Labor - OSHA  
6 World Trade Center, Room 881  
New York, NY 10048  
Telephone: (212) 466-2482

US Department of Labor - OSHA  
3300 Vikery Road  
North Syracuse, NY 13212  
Telephone: (315) 451-0808

US Department of Labor - OSHA  
660 White Plains Road  
4th Floor  
Tarrytown, NY 10591-5107  
Telephone: (914) 524-7510

US Department of Labor - OSHA  
1400 Old Court Road, Room 208  
Westbury, NY 11590  
Telephone: (516) 334-3344

US Department of Labor - OSHA  
Century Station, Room 438  
300 Fayetteville Street Mall  
Raleigh, NC 27601-9998  
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US Department of Labor - OSHA  
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Bismarck, ND 58501  
Telephone: (701) 250-4521

US Department of Labor - OSHA  
36 Triangle Park Drive  
Cincinnati, OH 45246  
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US Department of Labor - OSHA  
Federal Office Building, Room 899  
1240 East Ninth Street  
Cleveland, OH 44199  
Telephone: (216) 522-3818

US Department of Labor - OSHA  
Federal Office Building, Room 620  
200 N. High Street  
Columbus, OH 43215  
Telephone: (614) 469-5582

US Department of Labor - OSHA  
Federal Office Building, Room 734  
234 North Summit Street  
Toledo, OH 43604  
Telephone: (419) 259-7542

US Department of Labor - OSHA  
420 West Main Place, Suite 300  
Oklahoma City, OK 73102  
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1220 S.W. Third Avenue, Room 640  
Portland, OR 97204  
Telephone: (503) 326-2251

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850 N. 5th Street  
Allentown, PA 18102  
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US Department of Labor - OSHA  
3939 West Ridge Road  
Suite B-12  
Erie, PA 16506-1887  
Telephone: (814) 833-5758

US Department of Labor - OSHA  
Progress Plaza  
49 N. Progress Avenue  
Harrisburg, PA 17109  
Telephone: (717) 782-3902

US Department of Labor - OSHA  
U.S. Custom House, Room 242  
Second and Chestnut Street  
Philadelphia, PA 19106-2902  
Telephone: (215) 597-4955

US Department of Labor - OSHA  
Federal Building, Room 1428  
1000 Liberty Avenue  
Pittsburgh, PA 15222-4101  
Telephone: (412) 395-4903

US Department of Labor - OSHA  
Penn Place, Room 2005  
20 North Pennsylvania Avenue  
Wilkes-Barre, PA 18701-3590  
Telephone: (717) 826-6538

US Department of Labor - OSHA  
BBV Plaza Building  
1510 F.D. Roosevelt Avenue  
Guaynabo, PR 00968  
Telephone: (787) 277-1560

US Department of Labor - OSHA  
380 Westminster Mall, Room 243  
Providence, RI 02903  
Telephone: (401) 528-4669

US Department of Labor - OSHA  
1835 Assembly Street, Room 1468  
Columbia, SC 29201-2453  
Telephone: (803) 765-5904

US Department of Labor - OSHA  
2002 Richard Jones Road  
Suite C-205  
Nashville, TN 37215-2809  
Telephone: (615) 781-5423

US Department of Labor - OSHA  
903 San Jacinto Boulevard  
Suite 319  
Austin, TX 78701  
Telephone: (512) 916-5783

US Department of Labor - OSHA  
Wilson Plaza  
606 N. Carancahua, Suite 700  
Corpus Christi, TX 78476  
Telephone: (512) 888-3420

US Department of Labor - OSHA  
8344 East R.L. Thornton Freeway  
Suite 420  
Dallas, TX 75228  
Telephone: (214) 320-2400

US Department of Labor - OSHA  
North Star 2 Building  
Suite 302  
8713 Airport Freeway  
Fort Worth, TX 76180-7610  
Telephone: (817) 428-2470

US Department of Labor - OSHA  
17625 El Camino Real, Suite 400  
Houston, TX 77058  
Telephone: (281) 286-0583

US Department of Labor - OSHA  
350 North Sam Houston Parkway East  
Suite 120  
Houston, TX 77060  
Telephone: (281) 591-2438

US Department of Labor - OSHA  
Federal Building, Room 806  
1205 Texas Avenue  
Lubbock, TX 79401  
Telephone: (806) 472-7681

US Department of Labor - OSHA  
1781 South 300 West  
Salt Lake City, UT 84115-1802  
Telephone: (801) 487-0680

US Department of Labor - OSHA  
AFOB, Room 835  
200 Granby Mall  
Norfolk, VA 23510  
Telephone: (757) 441-3820

US Department of Labor - OSHA  
505 106th Ave, N.E., Suite 302  
Bellevue, WA 98004  
Telephone: (360) 553-7520

US Department of Labor - OSHA  
405 Capitol Street, Suite 407  
Charleston, WV 25301  
Telephone: (304) 347-5937

US Department of Labor - OSHA  
2618 North Ballard Road  
Appleton, WI 54911-8664  
Telephone: (920) 734-4521

US Department of Labor - OSHA  
Federal Building U.S. Courthouse  
500 Barstow Street, Room B-9  
Eau Claire, WI 54701  
Telephone: (715) 832-9019

US Department of Labor - OSHA  
4802 East Broadway  
Madison, WI 53716  
Telephone: (608) 264-5388

US Department of Labor - OSHA  
Henry S. Reuss Building  
Suite 1180  
310 West Wisconsin Avenue  
Milwaukee, WI 53202  
Telephone: (414) 297-3315



If you are unable to contact your local OSHA Area Office, you may contact the appropriate OSHA Regional Office for information and/or assistance.

**Region I****(CT,\* MA, ME, NH, RI, VT\*)**

JFK Federal Building

RME-340

Boston, MA 02203

Telephone: (617) 565-9860

**Region II****(NJ, NY,\* PR,\* VI\*)**

201 Varick Street

Room 670

New York, NY 10014

Telephone: (212) 337-2378

**Region III****(DC, DE, MD,\* PA, VA,\* WV)**

The Curtis Center - Suite 740 West

170 S. Independence Mall West

Philadelphia, PA 19106-3309

Telephone: (215) 861-4900

**Region IV****(AL, FL, GA, KY,\* MS, NC, SC,\* TN\*)**

Atlanta Federal Center

61 Forsyth Street, SW

Room 6T50

Atlanta, GA 30303

Telephone: (404) 562-2300

**Region V****(IL, IN,\* MI,\* MN,\* OH, WI)**

230 South Dearborn Street

Room 3244

Chicago, IL 60604

Telephone: (312) 353-2220

**Region VI****(AR, LA, NM,\* OK, TX)**

525 Griffin Street

Room 602

Dallas, TX 75202

Telephone: (214) 767-4731

**Region VII****(IA,\* KS, MO, NE)**

City Center Square

1100 Main Street, Suite 800

Kansas City, MO 64105

Telephone: (816) 426-5861

**Region VIII****(CO, MT, ND, SD, UT,\* WY\*)**

1999 Broadway, Suite 1690

Denver, CO 80202-5716

Telephone: (303) 844-1600

**Region IX****(American Samoa, AZ,\* CA,\* Guam,  
HI,\* NV,\* Trust Territories of the Pacific)**

71 Stevenson Street

4th Floor

San Francisco, CA 94105

Telephone: (415) 975-4310

**Region X****(AK,\* ID, OR,\* WA\*)**

1111 Third Avenue

Suite 715

Seattle, WA 98101-3212

Telephone: (206) 553-5930

*\*These states and territories operate their own OSHA-approved job safety and health programs (Connecticut and New York plans cover public employees only). States with approved programs must have a standard that is identical to, or at least as effective as, the federal standard.*