

# Chapter 12 – Personal Protective Equipment

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## **12.1 Foreword**

Personal protective equipment (PPE) includes all clothing and other work accessories designed to create a barrier against workplace hazards. Personal protective equipment is the least desirable method of protecting a worker against a hazard. Preferred methods of reducing or eliminating a safety hazard are engineering, work practice, and/or administrative controls. Personal protective equipment should be used in conjunction with these controls to provide for employee safety and health in the workplace. The basic element of any management program for personal protective equipment includes an in-depth evaluation of the equipment needed to protect against the hazards at the workplace. Management dedicated to the safety and health of employees then uses that evaluation to set a standard operating procedure for personnel, then train employees on the protective limitations of personal protective equipment, and on its proper use and maintenance.

## **12.2 Introduction**

Nearly two million people are expected to receive disabling work-related injuries this year. More than one-fourth of these injuries will involve the head, eyes, hands, or feet. Personal protective equipment, or PPE, is designed to protect the employee from health and safety hazards that cannot practically be removed from the work environment.

Federal Personal Protective Equipment standards (29 CFR 1910.132) require employers to:

- Conduct and document a hazard assessment for eye and face protection, head protection, hand protection, and foot protection for each work site;
- Select appropriate PPE based on the hazard assessment;
- Train employees in the proper use, limitations, and maintenance of PPE; and
- Make a reasonable effort to ensure the PPE fits properly.

Cal-OSHA indicates that the above issues are implicit requirements of the Injury and Illness Prevention Standard.

## **12.3 Applicability of Standard**

This policy applies to all employees who use any personal protective equipment in performing their tasks. It also applies to the supervisors of those individuals.

## **12.4 Responsibilities**

Various individuals are responsible for implementing the Personal Protective Equipment policy:

### **12.4.1 Agency/Department Heads**

Agency/department heads provide funding for the purchase of needed personal protective equipment.

## **12.4.2 Department Safety Coordinators**

Department Safety Coordinators coordinate completion of the Department's PPE Hazard Assessment(s), assist in the selection of appropriate PPE based on the Hazard Assessment, and coordinate PPE training for all employees who use PPE.

## **12.4.3 Supervisors**

Supervisors ensure that appropriate PPE is issued to employees, enforce the use of PPE when necessary, and assist the Safety Coordinator in proper training of each employee in the use, maintenance, and limitations of PPE.

## **12.4.4 Employees**

Each employee must care for and maintain PPE issued to him or her. Also each employee is responsible for using PPE when necessary.

## **12.4.5 Occupational Safety and Environmental Compliance (OSEC)**

OSEC (441-4280) is available to assist in proper selection of PPE and to assist with training.

## **12.4.6 US HealthWorks / Envirotech**

Performs medical exams and fit testing for respirator and self-contained breathing apparatus (SCBA) use for all county employees except VMC employees.

## **12.4.7 Valley Medical Center**

Performs medical exams and fit testing for respirator and self-contained breathing apparatus (SCBA) use for VMC employees.

# **12.5 Conducting the Hazard Assessment and Selecting Personal Protective Equipment**

The County must verify that the required workplace hazard assessment has been performed through a written certification that identifies the workplace evaluated; the person certifying that the evaluation has been performed; the date(s) of the hazard assessment; and that identifies the document as a certification of hazard assessment.

The Department Safety Coordinator or designee (usually the employee's supervisor) shall use the **Hazard Assessment and PPE Selection Worksheet** at the end of this section to conduct work-site assessments and identify what PPE should be used for individual work sites. The completed worksheet serves as the certification of hazard assessment. OSEC is available to assist; however, the hazard assessment/PPE selection process is not difficult once familiarity is gained with the worksheet and with the PPE Selection Process described below.

## **12.5.1 Hand Protection**

Fingers, hands, and arms are injured more often than any other parts of the body. A study prepared by the Bureau of Labor Statistics (BLS) indicated that 70% of the workers experiencing hand injuries were not wearing gloves. Hand injuries to the remaining 30% of the workers who were wearing gloves were caused by the gloves being either inadequate, damaged, or the wrong type for the type of hazard present.

## Hazard Assessment

To determine whether employees in the work area are at risk of receiving hand injuries such as cuts, abrasions or burns, consider whether the hands of employees have reasonable potential of coming into contact with:

- temperature extremes of heat or cold
- liquid chemicals (e.g. solvents, corrosives)
- electrical hazards
- hand tools used on a regular basis
- machinery or other equipment with the potential to cut or abrade the user
- blood and/or other body fluids

If so, specify the type of hazard(s) encountered at the work site on the Hazard Assessment/PPE Selection Worksheet, then select the appropriate hand protection as described below.

## Selection

A number of factors need to be taken into account when choosing a glove for a particular application. In the initial selection process the following are of primary importance:

- The toxic properties of the chemical or chemicals. In particular, the ability of the chemical to cause local effects on the skin and/or to pass through the skin and cause systemic effects should be known;
- The work activities being undertaken. These must be studied and account taken of the degree of dexterity required, the duration, frequency and degree of chemical exposure and the physical stresses which will be applied; and
- The performance characteristics of the gloves. These should be assessed using standard test procedures. Characteristics to be considered include chemical, puncture, tear and abrasion resistance.

Consider the following:

*Breakthrough.* Where chemical protective gloves are concerned, ensure that the glove's permeation and degradation levels match the application. Remember that permeation testing is conducted at 74 °F and with each 18°F temperature increase, the permeation rate roughly doubles, and breakthrough time (the time the glove breaks down and chemicals can seep through) decreases. Table 1 describes the types of chemicals which different glove materials will protect against.

Table 1 -- Different Glove Materials Protect Against Different Chemicals

*Latex (natural rubber):* Resists bases, alcohols, and diluted water solutions of chemicals. Protects against bodily fluids containing bloodborne pathogens. Offers fair protection from undiluted ketones and aldehydes. High resistance to cuts.

*Nitrile (synthetic rubber):* Good protection against oils, many flammables and solvents, corrosive bases, esters, grease, many animal fats, and bloodborne pathogens. Not recommended for ketones and some organic solvents. Excellent resistance to cuts and abrasions.

*Neoprene:* Resistant to a broad range of chemicals, including oils, acids, caustics, flammables, oxidizers, and solvents. Interior resistance to snags, cuts, punctures and abrasions compared to nitrile.

*Polyvinyl Chlorine (PVC):* Good protection against many acids, caustics, alkalis, bases, and alcohols. Not recommended for use with ketones and many other types of solvents. Good abrasion and cut resistance, but some glove styles are susceptible to cuts.

*Polyvinyl Alcohol (PVA):* High resistance to aliphatics, aromatics, chlorinated solvents, esters, and most ketones. Also resists snags, cuts, punctures, and abrasion, but quickly breaks down when exposed to water and light alcohols.

*Ethylene Vinyl Alcohol (EVOH):* One of the most chemically resistant materials available. Also known as flat-film gloves due to their unique construction from thin sheets of EVOH film. Highly resistant to a wide range of hazardous materials but negligibly resistant to physical damage. Usually worn as a liner under heavier PVC or nitrile gloves.

*Butyl:* Often selected for use with polar organics like acetone and dimethyl formamide. Ineffective against hydrocarbons and chlorinated solvents. Moderate resistance to cuts, snags, punctures and abrasions.

*Viton:* Recommended for use with organic solvents such as benzene, methylene chloride and carbon disulfide. Not for use with ketones, esters, and amines. Limited resistance to snags, cuts, punctures and abrasion.

Permeation, degradation, and penetration tests have been conducted for hundreds of chemicals using the most common glove materials. Sources of this information include:

- The Quick Selection Guide to Chemical Protective Clothing, 2nd ed. by Kristen Forsberg and S.Z. Mansdorf, Van Nostrand Reinhold, 1993 (ISBN 0-442-01215-2). This guide is available through the ITP Distribution Center, Professional and Reference Division, 800-842-3636.
- Chemical gloves vendors also have permeation, degradation, and penetration test data for gloves which they sell.

Federal OSHA notes that in general, any "chemical resistant" glove can be used for dry powders.

*Chemical mixtures and formulated products.* For protection against chemical mixtures and formulated products (unless specific test data are available, a glove should be selected on the basis of the chemical component with the shortest breakthrough time.)

*Temperature Extremes.* Specialized gloves are made for heat and cold protection. Some of these gloves also feature some chemical resistance.

*Electrical Hazards:* Certain occupations require special protection. For example, electricians need special protection from shocks and burns. Rubber is considered the best material for insulating gloves and sleeves from these hazards. Rubber protective equipment for electrical workers must conform to the requirements established in ANSI as specified in the following list:

<u>ITEM</u>	<u>STANDARD</u>
Rubber insulating gloves	ASTM D 120-87.
Rubber matting for use around electrical apparatus	ASTM D 178-88 or 178-93.
Rubber insulating blankets	ASTM D 1048-93 or 1048-88A.
Rubber insulating hoods	ASTM D 1048-88 or 1049-93.
Rubber insulating line hose	ASTM D 1050-90.
Rubber insulating sleeves	ASTM D 1051-87.

Gloves made for protection against electrical shock come in five different voltage classifications as described in Table 2.

Table 2 -- Different Glove Classes Protect Against Different Electrical Voltages

Class Test	AC Proof Voltage	AC Maximum Use Voltage ASTM D120-84a
0	5,000	Low Voltage (1,000V)
1	10,000	7,500
2	20,000	17,000
3	30,000	26,500
4	40,000	36,000

Rubber gloves must be used with leather gauntlets. The rubber insulates the skin from electrical shock, while the leather protects against electrical burns. Gloves and sleeves for electrical protection must be tested for integrity no more than six months from the date the plastic bag which contains the gloves/sleeves was opened but no less than once every year. Burlington Safety Laboratory, Inc. of San Ramon, California (510/866-1412) performs this service for the County.

*Dexterity.* Select unsupported (unlined) gloves for extra dexterity and sense of touch. If cut, snag, puncture or abrasion resistance are important, check the glove's physical characteristics, whether supported or unsupported.

*Grip.* Select a grip pattern that provides the grip needed for the job. The texture of the exterior of the glove may be smooth, rough, or embossed with raised rubber patterns.

*Length.* Where chemical protective gloves are concerned, choose glove length by the depth to which the arm will be immersed or exposed to chemical splash. Select thin gauge gloves for jobs demanding sensitive touch and high flexibility. If greater protection or durability is desired, choose a heavy-duty style.

*Size.* Lastly, choose glove sizes that will ensure optimum wear, comfort, and employee satisfaction.

In conclusion, choose the glove with the highest rating for the chemical and physical conditions involved.

## 12.5.2 Foot Protection

According to the Bureau of Labor Statistics survey, most of the workers in selected occupations who suffered foot injuries were not wearing protective footwear. Furthermore, most of their employers did not require them to wear safety shoes. The typical foot injury was caused by objects falling fewer than 4 feet and the median weight was about 65 pounds. Most workers were injured while performing their normal job activities at their worksites.

### Hazard Assessment

To determine whether employees in the work area are at risk of receiving foot injuries, consider whether the feet of employees have reasonable potential of coming into contact with:

- Puncture hazards from sharp objects such as nails, wire, tacks, screws, staples, scrap metal, glass chips, etc. on the floor or ground.
- Compression hazards such as from skid trucks (manual material handling carts), bulk rolls (such as paper rolls), 55-gallon drums, or heavy pipes all of which could potentially roll over onto the feet
- Impact hazards resulting from carrying or handling materials such as packages, objects, parts or heavy tools, which could be dropped or other activities where objects might fall onto the feet
- Electrical hazards
- Temperature extremes as from molten metal dripping onto the feet or from walking over molten asphalt.

If so, specify the type of hazard(s) encountered at the work site on the Hazard Assessment/PPE Selection Worksheet, then select the appropriate foot protection as described below.

### Selection

County of Santa Clara has contracts with two safety shoe vendors: Iron Age Corporation and Beck's Shoes, Inc.. By clearly specifying the types of hazards the employee will face on the job, these vendors can assist the employee in selecting the proper shoe or boot.

In addition, in the back of each vendors' catalogs are charts which rate the soles of the various shoes on the following criteria: oil resistance, heat resistance, chip resistance, chemical resistance, and slip resistance (traction). Use this chart to assist in the selection of the proper sole.

All safety shoes/boots issued to County employees shall be steel-toed and meet the ANSI Z41-1991 Standard for impact and compression protection [minimum 75-pound impact/compression resistances, (I75/C75)]. Shoes and boots meeting this standard will have "Z41-91" printed on the shoe/boot.

If the employee works with heavy rolling objects such as storage tanks or performs metal welding, choose a shoe/boot with metatarsal protection. The metatarsal protection will protect the top of the foot and the shoe/boot laces from molten metal drippings.

If the employee's feet come into contact with temperature extremes, choose a boot with temperature insulating properties.

If the employee must frequently walk over uneven surfaces, choose a boot/shoe with good ankle support. In this case, the shoe should be at least 6" high.



If the employee faces electrical hazards (EH), choose footwear specifically designed for electrical insulation.

For electrostatic hazards, choose electrostatic discharge (ESD) footwear which is designed to inhibit the generation of static electricity and helps discharge static electricity from your body through the shoes into a grounded floor. *Floors must be grounded-conductive to dissipate charge.*

If the employee must walk indoors or outdoors on very hot or very cold surfaces, the metal toe guards in "steel-toe" safety shoes may transmit the temperature extremes to the wearer's toes. Special thermal safety shoes should be considered.

Finally, consider whether the footwear should also be waterproof. After determining all features which are needed to adequately protect the employee, ask an Iron Age or Beck's Shoes vendor to assist you in selecting a boot/shoe that meets your criteria.

### **12.5.3 Eye and Face Protection**

Eye and face protective equipment is required where there is a reasonable probability of preventing injury when such equipment is used. Supervisors must provide to their workers a type of protector suitable for work to be performed, and employees must use the protectors. These stipulations also apply to supervisors and management personnel, and should apply to visitors while they are in hazardous areas.

Suitable eye protectors must be provided where there is a potential for injury to the eyes or face from flying particles, molten metal, liquid chemicals, acids or caustic liquids, chemical gases or vapors, potentially injurious light radiation or a combination of these. Protectors must meet the following minimum requirements:

- Provide adequate protection against the particular hazards for which they are designed;
- Be reasonably comfortable when worn under the designated conditions;
- Fit snugly without interfering with the movements or vision of the wearer;
- Be durable;
- Be capable of being disinfected;
- Be easily cleanable; and
- Be kept clean and in good repair.

Every protector shall be distinctly marked to facilitate identification of the manufacturer.

#### Hazard Assessment

To determine whether employees in the work area are at risk of receiving eye or face injuries such as punctures, abrasions or burns, consider whether the eyes of employees have a reasonable potential of coming into contact with:

- flying particles
- excessive heat such as from furnace operations or pouring molten metal
- liquid chemicals, esp. corrosive liquids

- chemical gases or vapors
- hazardous light rays such as from welding, electrical, or laser activities
- building projections such as protruding rods or wires during construction
- moving machinery at eye level
- glare such as from working outdoors
- blood or other body fluids

If so, specify the type of hazard(s) encountered at the work site on the Hazard Assessment/PPE Selection Worksheet, then select the appropriate eye and/or face protection as described below.

Selection -- Each eye, face, or face-and-eye protector is designed for a particular hazard. In selecting the protector, consider kind and degree of hazard, and select the protector accordingly. Where a choice of protectors is given, and the degree of protection required is not an important issue, worker comfort may be a deciding factor. A Bureau of Labor Statistics (BLS) survey showed that few workers ever complained about poor vision or discomfort with personal eye protection equipment.

The survey noted that the typical injury was caused by flying or falling blunt metal objects. Lacerations, fractures, broken teeth, and contusions were common types of injuries reported.

Persons who use corrective spectacles and those who are required by OSHA to wear eye protection must wear face shields, goggles, or spectacles of one of the following types:

- Spectacles with protective lenses providing optical correction;
- Goggles or face shields worn over corrective spectacles without disturbing the adjustment of the spectacles; or
- Goggles that incorporate corrective lenses mounted behind the protective lenses.

When limitations or precautions are indicated by the manufacturer, they should be communicated to the user and strictly observed.

Over the years, many types and styles of eye and face-and-eye protective equipment have been developed to meet the demands for protection against a variety of hazards.

Goggles come in a number of different styles: eyecups, flexible or cushioned goggles, plastic eyeshield goggles, and foundrymen's goggles. Goggles are manufactured in several styles for specific uses such as protecting against dusts and splashes, and in chipper's, welder's, and cutter's models.

Safety spectacles require special frames. Combinations of normal streetwear frames with safety lenses are not in compliance.

Many hard hats and nonrigid helmets are designed with face and eye protective equipment.

Protective eye and face devices must comply with ANSI Z87.1-1989, American National Standard Practice for Occupational and Educational Eye and Face Protection.

Table 3 summarizes selection criteria:

Table 3 -- Eye and Face Protection Selection Table

Source	Assessment of Hazard	Protection
IMPACT – Chipping, grinding, machining, masonry, work, wood-working, sawing, drilling, chiseling, powered fastening, riveting, and sanding	Flying fragments, objects, large chips, particles, sand, dirt, etc	Spectacles with side protection or goggles. For severe exposure, use face shield. See notes 1, 3, 5, 6, 10.
HEAT -- Furnace operations, pouring, casting, hot dipping and welding	Hot sparks	Goggles, or spectacles with side protection. For severe exposure, use faceshield. See notes 1,2,3.
	Splash from molten metals	Faceshields worn over goggles. See notes 1,2,3.
	High temperature exposure	Reflective face shield. See notes 1,2,3.
CHEMICALS -- Acid and chemicals handling, degreasing, and plating	Splash	Indirectly vented goggles. For severe exposure, use face shield. See notes 3, 11.
	Irritating mists	Indirectly vented or non-vented goggles. For severe exposure, use face shield.
DUST -- Woodworking, buffing, general dusty conditions.	Nuisance Dust	Goggles. See note 8.
LIGHT and/or RADIATION		
General Electrical Work	Optical radiation	Spectacles with polycarbonated lenses which protect against radiation with wavelengths of 200-400 nanometers (ultra-violet), 430 - 440 nanometers (blue light), 770 - 1440 nanometers (infrared radiation), and 1400-2000 nanometers.
Welding: Electric Arc	Optical radiation	Welding helmets or welding shields. Typical shades: 10-14. See notes 9, 12.
Welding: Gas	Optical radiation	Welding goggles or welding face shield. Typical shades: gas welding 4-8, cutting 3-6, brazing 3-4. See note 9
Cutting, Torch brazing, Torch soldering	Optical radiation	Spectacles or welding face shields: Typical shades: 1.5-3. See notes 3, 9.
Glare	Poor vision	Spectacles with shaded or special-purpose lenses, as suitable, e.g.. UV protective lenses for outdoor work. See notes 9, 10.
Laser	Optical radiation	Spectacles with laser protective lenses. See laser paragraph below.
BLOOD/BODY FLUIDS	Bloodborne pathogens splash	Spectacles with side protection
Notes to Eye and Face Protection Selection Table:		
(1) Care should be taken to recognize the possibility of multiple and simultaneous exposure to a variety of hazards. Adequate protection against the highest level of each of the hazards should be provided. Protective devices do not provide unlimited protection.		
(2) Operations involving heat may also involve light radiation. As required by the standard, protection from both hazards must be provided.		

- (3) Faceshields should only be worn over primary eye protection (spectacles or goggles).
- (4) As required by the standard, filter lenses must meet the requirements for shade designations in 29 CFR, §1910.133 (a)(5). Tinted and shaded lenses are not and shaded lenses are *not* filter lenses unless they are marked or identified as such. See tables 4-2a and 4-2b below.
- 5) As required by the standard, persons whose vision requires the use of prescription (Rx) lenses must wear either protective devices fitted with prescription (Rx) lenses or protective devices designed to be worn over regular prescription (Rx) eyewear.
- (6) Wearers of contact lenses must also wear appropriate eye and face protection devices in a hazardous environment. It should be recognized that dusty and/or chemical environments may represent an additional hazard to contact lens wearers.
- (7) Caution should be exercised in the use of metal frame protective devices in electrical hazard areas.
- (8) Atmospheric conditions and the restricted ventilation of the protector can cause lenses to fog. Frequent cleansing may be necessary.
- (9) Welding helmets or faceshields should be used only over primary eye protection (spectacles or goggles).
- (10) Non-sideshield spectacles are available for frontal protection only, but are not acceptable eye protection for the sources and operations listed for "impact."
- (11) Ventilation should be adequate, but well protected from splash entry. Eye and face protection should be designed and used so that it provides both adequate ventilation and protects the wearer from splash entry
- (12) Protection from light radiation is directly related to filter lens density. See note (4). Select the darkest shade that allow task performance.

Bear in mind that although the face shield or welding helmet is the first barrier a flying particle will strike, it is still considered secondary protection. According to ANSI Z87.1-1989, "Face shields are secondary protectors and shall be used only with primary protectors." Face shields are for protection of the skin of the face only; they are not eye protection. Face shields must always be used in combination with goggles or safety glasses.

*Laser Protection Eyewear*

When choosing laser eyewear, first determine the required optical density or "O.D." Optical density is perhaps the single most confusing and important factor to consider when choosing laser eye protection. It is determined by a mathematical formula that takes into account the wavelength, power, and beam diameter. For pulsed lasers, the pulse duration and repetition rate also must be considered. This calculation determines the minimum level of attenuation needed to reduce the beam to a safe level. Guidance for O.D. calculations are listed in ANSI Z136.1. To order a copy of ANSI Z136.1 or any other ANSI standard, contact ANSI at 212-642-4900.

Table 4 demonstrates the relationship between O.D. and attenuation. The greater the laser beam's power, the higher the attenuation factor will be.

Table 4 -- Relationship Between Optical Density and Attenuation Factors

OPTICAL DENSITY (O.D.)	ATTENUATION FACTOR
1	10
2	100
3	1000
4	10,000
5	100,000
6	1,000,000

Laser protection eyewear must always have at least the minimum O.D. required. If an O.D. of 5 is required, but your eyewear only has an O.D. of 4, then the transmission would be above the maximum permissible exposure by a magnitude of 10.

Next consider the factor of time. In other words, how much time will the employee have to react if hit by a reflected or direct laser beam. Laser eyewear should list the time and irradiance against which the filters were tested.

Diffuse viewing plastic eyewear is recommended for diffuse viewing only. It should not be used for intrabeam viewing or protection from reflected beams. Finally, the wavelength of the eyewear must correspond to the wavelength of the laser.

*Radiant Energy Protective Eye/Facewear*

To select eye and face protective equipment for protection against radiant energy as in welding, soldering, or brazing, determine the minimum lens protection shade required using Tables 5a and 5b.

Table 5a -- Filter Lenses for Protection Against Radiant Energy

Operations	Electrode Size 1/32 in.	Arc Current	Minimum Protective Shade
Shielded metal arc welding	Less than 3	Less than 60	7
	3-5	60-160	8
	5-8	160-250	10
	More than 8	250-550	11
Gas metal arc welding flux cored arc welding		Less than 60	7
		60-160	10
		160-250	10
		250-500	10
Gas Tungsten arc welding		Less than 50	8
		50-150	8
		150-500	10
Air Carbon Arc cutting	(Light)	Less than 500	10
	(Heavy)	500-1000	11
Plasma arc welding		less than 20	6
		20-100	8
		100-400	10
		400-800	11
Plasma arc cutting	(light)**	less than 300	8
	(medium)**	300-400	9
	(heavy)**	400-800	10
Torch brazing			3
Torch soldering			2
Carbon arc welding			14

Table 5b -- Filter Lenses for Protection Against Radiant Energy

Operations	Plate Thickness -- inches	Plate Thickness (mm)	Minimum Protective Shade
Gas Welding			
Light	Under 1/8	Under 3.2	4
Medium	1/8 to 1/2	3.2 to 12.7	5
Heavy	Over 1/2	Over 12.7	6
Oxygen Cutting			
Light	Under 1	Under 3.2	3
Medium	1 to 6	25 to 150	4
Heavy	Over 6	Over 150	5

Notes for Tables 5a and 5b

\* 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.

Vision Correction

Where eye protection is required and the employee requires vision correction, the County shall provide the employee with the necessary corrective safety lenses or with eye protection that can be worn over the prescription lenses without disturbing the proper position of the prescription lenses.

Inspection and Maintenance

It is essential that the lenses of eye protectors be kept clean. Continuous vision through dirty lenses can cause eye strain often an excuse for not wearing the eye protectors. Daily inspection and cleaning of the eye protector with soap and hot water, or with a cleaning solution and tissue, is recommended.

Pitted lenses, like dirty lenses, can be a source of reduced vision. They should be replaced. Deeply scratched or excessively pitted lenses are apt to break more readily.

Slack, worn-out, sweat-soaked, or twisted headbands do not hold the eye protector in proper position. Visual inspection can determine when the headband elasticity is reduced to a point below proper function.

Goggles should be kept in a case when not in use. Spectacles, in particular, should be given the same care as one's own glasses, since the frame, nose pads, and temples can be damaged by rough usage.

Personal protective equipment that has been previously used should be disinfected before being issued to another employee.

Also, when each employee is assigned protective equipment for extended periods, it is recommended that such equipment be cleaned and disinfected regularly.

Several methods for disinfecting eye-protective equipment are acceptable. The most effective method is to disassemble the goggles or spectacles and thoroughly clean all parts with soap and warm water. Carefully

rinse all traces of soap, and replace defective parts with new ones. Swab thoroughly or completely and immerse all parts for 10 minutes in a solution of germicidal deodorant fungicide. Remove parts from solution and suspend in a clean place for air drying at room temperature or with heated air. Do not rinse after removing parts from the solution because this will remove the germicidal residue which retains its effectiveness after drying.

The dry parts or items should be placed in a clean, dust-proof container, such as a box, bag, or plastic envelope, to protect them until reissue.

## **12.5.4 Head Protection**

Prevention of head injuries is an important factor in every safety program. A survey by the Bureau of Labor Statistics (BLS) of accidents and injuries noted that most workers who suffered impact injuries to the head were not wearing head protection. The majority of workers were injured while performing their normal jobs at their regular worksites.

The BLS survey noted that more than one-half of the workers were struck on the head while they were looking down and almost three-tenths were looking straight ahead. While a third of the unprotected workers were injured when bumping into stationary objects, such actions injured only one-eighth of hard hat wearers. Elimination or control of a hazard that led to or might lead to an accident should, of course, be given first consideration, but many accidents causing head injuries are of a type difficult to anticipate and control. Where these conditions exist, head protection must be provided to eliminate injury.

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

The standards recognized by Federal OSHA for protective helmets are contained in ANSI Personnel Protection -- Protective Headwear for Industrial Workers-Requirements, Z89.1-1986.

### Hazard Assessment

To determine whether employees in the work area are at risk of receiving head injuries, consider whether the heads of employees have reasonable potential of coming into contact with:

- Impact and penetration hazards such as those caused by moving machinery, falling or flying objects, or stationary, protruding objects commonly found in construction, tunneling, and lumbering operations.
- Overhead electrical hazards.

If so, specify the type of hazard(s) encountered at the work site on the Hazard Assessment/PPE Selection Worksheet, then select the appropriate head protection as described below.

### Selection

Each type and class of head protector is intended to provide protection against specific hazardous conditions. An understanding of these conditions will help in selecting the right hat for the particular situation.

Protective hats are made in the following types and classes:

- Type 1 - helmets with full brim, not less than 1 and 1/4 inches wide;
- Type 2 - brimless helmets with a peak extending forward from the crown.

For industrial purposes, three classes are recognized:

- Class A - general service, limited voltage protection;
- Class B - utility service, high-voltage protection; and
- Class C - special service, no voltage protection.

Hats and caps under Class A are intended for protection against impact hazards. They are used in mining, construction, shipbuilding, tunneling, lumbering, and manufacturing. They are the most appropriate type of hard hat to be used by County employees engaged in non-electrical tasks.

Class B utility service hats and caps protect the wearer's head from impact and penetration by falling or flying objects and from high-voltage shock and burn. They are used extensively by electrical workers.

The safety hat or cap in Class C is designed specifically for lightweight comfort and impact protection. This class is usually manufactured from aluminum and offers no dielectric protection. Class C helmets are used in certain construction and manufacturing occupations, oil fields, refineries, and chemical plants where there is no danger from electrical hazards or corrosion. They also are used on occasions where there is a possibility of

The latest revision of the standard (ANSI Z89.1-1997) changes hard hat classifications. Future hard hats will appear with the following Classes:

- Class G - General (former Class A), Proof tested to 2,200 volts
- Class E - Electrical (former Class B), Proof tested to 22,000 volts
- Class C - Conductive (former Class C), No electrical protection

bumping the head against a fixed object.

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

The wearer should be able to identify the type of helmet by looking inside the shell for the manufacturer, ANSI designation and class. For example:

Manufacturer's Name  
ANSI Z89.1-1969 (or later year)  
Class A



## 12.6 Safety Shoes

For safety shoes, eligible employees shall take a Contract Release Form and an Authorization Form to an approved vendor directly. The vendor assists the employee in the selection and personal fitting of shoes. The Department Purchasing Representative provides Contract Releases. A sample Authorization Form is found at the end of this section.

A selection of shoes which meet minimum safety standards will be available at or below the County's standard allowable cost. Check with the Department's Purchasing Representative to determine the current standard allowable cost.

An employee may elect to purchase safety shoes which exceed the standard allowable cost. In this case, the employee will pay the difference.

### 12.6.1 Safety Shoe Exemptions

Supervisors who would like to exempt an employee from wearing safety shoes shall submit an Exemption Request and copy of the Job Classification Description to the Department Head, County Wide Safety Committee, and the County Executive. A copy of the Exemption Request is found at the end of this section.

Before submitting an Exemption Request, the supervisor shall determine that the employee's job requirements present no exposure to the employee for foot/ankle/toe injuries. See exposures listed on the Certification of Hazard Assessment and Personal Protective Equipment Worksheet found at the end of this section.

### 21.6.2 Safety Shoe Appeals

An employee who believes that his/her job subjects him/her to the types of foot hazards described in the Certification of Hazard Assessment and Personal Protective Equipment Selection Worksheet and who is not currently eligible to receive safety shoes shall speak to his/her Union Steward about submitting an appeal to the County-Wide Joint Labor and Management Safety Committee.

## 21.7 Ensuring Proper Fit

OSHA regulations and common sense dictate that PPE must properly fit the user. PPE that fits poorly will not afford the necessary protection. OSHA is particularly concerned that female employees have often had to "make do" with ill-fitting garments designed for men. Guidelines for fitting protective equipment are described below.

### 12.7.1 Hand Protection

Determine the employee's proper hand size before ordering gloves. Use a tape measure to find the circumference of the hand around the palm area. This measurement, in inches, is closest to the actual glove size. For example, 7" is equal to a size 7 glove. The size chart below will assist in helping to find the correct glove size, but note that sizes may vary among styles and manufacturers.

---

<i>Glove Size</i>				
XS	S	M	L	XL

  

Hand Size				
6-7	7-8	8-9	9-10	10-11

---

## 12.7.2 Foot Protection

The County's safety shoe vendors are responsible for assisting employees in selecting a shoe that fits properly and offering foot protection appropriate for their job tasks. Safety shoes are fitted in the same way as ordinary shoes. The shoe vendor will measure the employee's feet and recommend an appropriate size based on the measurements and the brand of shoe the employee is interested in. The inside of the protective steel toe cap should not touch any part of the toes when the shoes are properly fitted. Realize that shoe sizes vary among styles and manufacturers, so employees should never buy any safety shoes without trying them on for size and comfort.

## 12.7.3 Eye Protection

Upon issuing eye protection, ask the employee to consider the issues outlined below. The employee must be able to answer affirmatively to all questions.

### Safety Spectacles

- Do the spectacles grip the bridge of the nose comfortably, so the spectacles do not slide down the face but such that the nose is not pinched?
- Does the frame grip the temples comfortably without irritating pressure points?
- Do the spectacles have the correct temple length so that the frames do not pinch the ears but also are not too loose at the ears?

Note: Prescription safety spectacles should be fitted only by qualified optical personnel.

### Safety Goggles

- Can the straps of the goggles be adjusted so that the goggles fit securely and comfortably across the face?

## 12.7.4 Head and Face Protection

Be sure the employee understands how to adjust the ratcheting headband within the head and/or face protection so the equipment fits correctly. The headbands are adjustable in 1/8" size increments. When the headband is adjusted to the right size, it provides sufficient clearance between the shell and headband. The removable or replaceable type sweatband should cover at least the forehead portion of the headband.

## 12.8 Employee Training

General training requirements for employees required to use eye, face, head, foot, and hand protection are described below. Specific PPE training guides for are provided at the end of this section.

### 12.8.1 General Training Requirements

Employees who must use eye, face, head, foot, and/or hand protection must be trained to know at least the following:

- When the PPE is necessary;
- What specific type of PPE is necessary;

- How to properly don, doff, adjust, and wear PPE;
- The limitations of the PPE; and
- The proper care, maintenance, useful life, and disposal of the PPE

Each affected employee shall demonstrate understanding of the training and the ability to use PPE properly *before* being allowed to perform work requiring the use of PPE.

Department Safety Coordinators shall ensure that PPE training is documented for each employee, including employee name or other identifier, training dates, and name of the training provider.

When a Supervisor has reason to believe that any affected employee who has already been trained does not have the understanding and skill required above, the supervisor shall retrain each such employee.

Circumstances where retraining is required include, but are not limited to:

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

## **12.8.2 Respirator & SCBA Training & Medical Surveillance Requirements**

- Employees who use respirators and self-contained breathing apparatus (SCBA) need to be trained for initial use and a refresher training every two years.
- All employees will need medical surveillance for respirator and SCBA use.

## **12.9 Applicable Regulations**

CAL/OSHA, Title 8, CALIFORNIA CODE OF REGULATIONS, Sections 3380-3385

## **12.10 Appendices**

## 12.10.1 Appendix A: Personal Protective Equipment Worksheet

### CERTIFICATION OF HAZARD ASSESSMENT AND PERSONAL PROTECTIVE EQUIPMENT SELECTION WORKSHEET

All sections must be completed.

Date of Assessment \_\_\_\_\_

Name(s) of Evaluators \_\_\_\_\_

Job Title of Evaluator(s) \_\_\_\_\_

Description of Worksite Location or Employees to Which Hazard Assessment Applies  
\_\_\_\_\_  
\_\_\_\_\_

#### Head Protection

The heads of employees at this worksite have a reasonable potential of coming into contact with: \_\_\_\_\_ If yes, then select \_\_\_\_\_

Overhead low voltage conductors to 2,200 volts and impact and penetration hazards  
Yes \_\_\_\_\_ No \_\_\_\_\_ Class A Helmets

Overhead high voltage conductors to 20,000 volts and impact and penetration hazards  
Yes \_\_\_\_\_ No \_\_\_\_\_ Class B Helmets

Impact and Penetration Hazards Only:  
(e.g. moving machinery, falling or flying objects, and/or protruding, stationary objects.)  
Yes \_\_\_\_\_ No \_\_\_\_\_ Class C Helmets

#### Hand Protection

The hands of employees at this worksite have a reasonable potential of coming into contact with: \_\_\_\_\_

Temperature extremes of heat or cold	Yes _____	No _____
Liquid chemicals (e.g. solvents, corrosives)	Yes _____	No _____
Electrical hazards	Yes _____	No _____
Hand tools used on a regular basis	Yes _____	No _____
Machinery or other equipment with the potential to cut or abrade the user	Yes _____	No _____
Blood or other body fluids	Yes _____	No _____

If you answered yes to any of the above, specify the hand protective equipment selected per the guidelines in the Injury and Illness Prevention Program and Section 4 of the Safety Coordinator's Manual.  
\_\_\_\_\_  
\_\_\_\_\_

Distribution: Department Safety Coordinator

## 12.10.1 Appendix A: Personal Protective Equipment Worksheet

### Eye/Face Protection

The eyes and/or face of employees at this worksite have a reasonable potential of coming into contact with:

If yes, then select

IMPACT HAZARDS-- Chipping, grinding, machining, masonry, wood-working, sawing, drilling, chiseling, powered fastening, riveting, and sanding

Yes \_\_\_\_\_ No \_\_\_\_\_

Spectacles with side protection or goggles. For severe exposure, use face shield. See notes 1, 3, 5, 6,10.

HEAT HAZARDS-- Furnace operations, pouring, casting, hot dipping and welding.

Yes \_\_\_\_\_ No \_\_\_\_\_

Goggles, or spectacles with side protection. For severe exposure, use faceshield. See notes 1,2,3.

Splash from molten metals

Yes \_\_\_\_\_ No \_\_\_\_\_

Faceshields worn over goggles. See notes 1,2,3.

High temperature exposure

Yes \_\_\_\_\_ No \_\_\_\_\_

Reflective face shield. See notes 1,2,3.

CHEMICAL HAZARDS-- Acid and chemicals handling, degreasing and plating

Yes \_\_\_\_\_ No \_\_\_\_\_

Indirectly vented goggles. For severe exposure, use face shield. See notes 3, 11.

Irritating mists

Yes \_\_\_\_\_ No \_\_\_\_\_

Indirectly vented or non-vented goggles. For severe exposure, use face shield.

DUST -- Woodworking, buffing, general dusty conditions. Yes \_\_\_\_\_ No \_\_\_\_\_

Goggles. See note 8.

### LIGHT and/or RADIATION

General Electrical Work

Yes \_\_\_\_\_ No \_\_\_\_\_

Spectacles with polycarbonated lenses which protect against radiation with wavelengths of 200-400 nanometers (ultra-violet), 430-440 nanometers (blue light), 770-1440 nanometers (infrared radiation), and 1400-2000 nanometers.

Welding: Electric Arc

Yes \_\_\_\_\_ No \_\_\_\_\_

Welding helmets or welding shields. Typical shades: 10-14. See notes 9, 12.

Welding: Gas

Yes \_\_\_\_\_ No \_\_\_\_\_

Welding goggles or welding face shield. Typical shades: gas welding 4-8, cutting 3-6, brazing 3-4. See note 9

Cutting, Torch brazing, Torch soldering

Yes \_\_\_\_\_ No \_\_\_\_\_

Spectacles or welding faceshields: Typical shades: 1.5-3. See notes 3, 9.

Glare

Yes \_\_\_\_\_ No \_\_\_\_\_

Spectacles with shaded or special-purpose lenses as suitable, e.g.. UV protective lenses for outdoor work. See notes 9, 10.

Laser

Yes \_\_\_\_\_ No \_\_\_\_\_

Spectacles with laser protective lenses. See the Injury and Illness Prevention Program or Section 4 of Safety Coordinators Manual.

BLOOD/BODY FLUIDS

Yes \_\_\_\_\_ No \_\_\_\_\_

Spectacles with side protection.

## 12.10.1 Appendix A: Personal Protective Equipment Worksheet

If you answered yes to any of the above, specify the eye/face protective equipment selected per the guidelines in this table and in the Injury and Illness Prevention Program or Section 4 of the Safety Coordinator's Manual.

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## 12.10.1 Appendix A: Personal Protective Equipment Worksheet

Notes to Eye and Face Protection Selection Table:

- (1) Care should be taken to recognize the possibility of multiple and simultaneous exposure to a variety of hazards. Adequate protection against the highest level of each of the hazards should be provided. Protective devices do not provide unlimited protection.
- (2) Operations involving heat may also involve light radiation. As required by the standard, protection from both hazards must be provided.
- (3) Faceshields should only be worn over primary eye protection (spectacles or goggles).
- (4) As required by the standard, filter lenses must meet the requirements for shade designations in 29 CFR, §1910.133 (a)(5). Tinted and shaded lenses are not and shaded lenses are *not* filter lenses unless they are marked or identified as such. See tables 4-2a and 4-2b below.
- (5) As required by the standard, persons whose vision requires the use of prescription (Rx) lenses must wear either protective devices fitted with prescription (Rx) lenses or protective devices designed to be worn over regular prescription (Rx) eyewear.
- (6) Wearers of contact lenses must also wear appropriate eye and face protection devices in a hazardous environment. It should be recognized that dusty and/or chemical environments may represent an additional hazard to contact lens wearers.
- (7) Caution should be exercised in the use of metal frame protective devices in electrical hazard areas.
- (8) Atmospheric conditions and the restricted ventilation of the protector can cause lenses to fog. Frequent cleansing may be necessary.
- (9) Welding helmets or faceshields should be used only over primary eye protection (spectacles or goggles).
- (10) Non-sideshield spectacles are available for frontal protection only, but are not acceptable eye protection for the sources and operations listed for "impact."
- (11) Ventilation should be adequate, but well protected from splash entry. Eye and face protection should be designed and used so that it provides both adequate ventilation and protects the wearer from splash entry.
- (12) Protection from light radiation is directly related to filter lens density. See note (4). Select the darkest shade that allow task performance.

### Foot Protection

The feet of employees at this worksite have a reasonable potential of coming into contact with:

---

Puncture hazards from sharp objects (e.g. nails, wire, staples)	Yes _____	No _____
Compression hazards such as from skid trucks, bulk rolls, 55-gallon drums, pipes or other objects which could potentially roll over onto the feet.	Yes _____	No _____
Impact hazards resulting from carrying or handling materials such as packages, objects, parts or heavy tools, which could be dropped or other activities where objects might fall onto the feet.	Yes _____	No _____
Electrical or electrostatic hazards	Yes _____	No _____
Chemical hazards such as from corrosive substances or hot tar	Yes _____	No _____
Temperature extremes such as from molten metal dripping onto the feet or from walking through molten asphalt	Yes _____	No _____

Select safety footwear which is specifically designed to protect against the hazards specified above. The County's safety footwear vendors can assist in the selection process. More detailed information on the selection process is provided in the Injury and Illness Prevention Program and Section 4 of the Safety Coordinator's Manual.

### Respiratory and Hearing Protection

Information on selecting respiratory and hearing protection are provided in the Injury and Illness Prevention Program and Section 4 of the Safety Coordinator's manual. Selection of respiratory and hearing protection is to be performed by the Department Safety Coordinator in conjunction with Occupational Safety and Environmental Compliance.

### Signature of Evaluator(s)

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## 12.10.1 Appendix A: Personal Protective Equipment Worksheet

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## 12.10.2 Appendix B: Safety Shoe Procedures

### COUNTY OF SANTA CLARA SAFETY SHOE REIMBURSEMENT PROGRAM EXEMPTION REQUEST

To be completed by Department/ Agency:

1. Name of Employee and Job Classification Recommended for Exemption from Mandatory Wearing Requirement of Safety Shoes:

\_\_\_\_\_

\_\_\_\_\_

2. Number of Authorized Positions in this Job Classification: \_\_\_\_\_

3. Number of Positions for which Exemption is being Requested: \_\_\_\_\_

4. Name and Address of Work Location(s) of Positions in #3: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

5. Reasons for This Position to be Exempted:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

I have reviewed the job tasks of this Position and have found no exposure to foot/ankle/toe injuries resulting from puncture hazards as from walking over sharp objects, compression hazards as from heavy objects which could potentially roll over onto the feet, impact hazards resulting from carrying or handling heavy materials which could be dropped or other activities where objects might fall onto the feet, electrical or electrostatic hazards, chemical hazards such as from corrosive substances or hot tar, or temperature extremes. A copy of the Job Classification Description is attached.

Submitted by: \_\_\_\_\_, IMMEDIATE SUPERVISOR

Signature: \_\_\_\_\_, DATE \_\_\_\_\_

Exemption Request Has Been:

(CIRCLE ONE)

APPROVED/DENIED \_\_\_\_\_ DEPARTMENT HEAD

APPROVED/DENIED \_\_\_\_\_, CO-WIDE SAFETY COMM.

APPROVED/DENIED \_\_\_\_\_, COUNTY EXECUTIVE

\_\_\_\_\_

## 12.10.2 Appendix B: Safety Shoe Procedures

### SAMPLE AUTHORIZATION FORM (TO BE PRINTED ON DEPARTMENT'S LETTERHEAD)

DATE \_\_\_\_\_

(Beck's Shoes, Inc.  
3687 Union Ave.  
San Jose, CA 95124)

or  
(Iron Age Corporation  
1626 Old Bayshore Highway  
San Jose, CA 95112)

Employee Name \_\_\_\_\_

Employee Number (SSN#) \_\_\_\_\_

Employee Classification \_\_\_\_\_

Department \_\_\_\_\_

Dollar Limit \_\_\_\_\_

This is authorization for the purchase of safety shoes/boots and is valid for one month from the date of issue.

The employee may select safety shoes/boots from the styles that have been approved as suitable for his/her work. Some styles may exceed the amount the County will pay. The employee has been informed that when a selection of shoes or boots exceeds the standard allowable cost, the employee will pay the difference at time of purchase.

Thank you.

(Authorizing Supervisor)  
(Job Title)

## 12.10.3 Appendix C: PPE Training

### Training Guidelines for Eye and Face Protection

The training shall consist of providing the following information at a minimum:

#### When is the PPE necessary?

- Share the results of the Hazard Assessment and Personal Protective Equipment Survey. Based on the results of the hazard assessment, describe all work situations in which the employee is required to wear the eye/face protection.

#### What specific types of PPE are necessary?

- Describe the process used to select the specific types of eye/face protection required for the different work situations. It may be useful to share the eye/face protection selection charts shown in the Injury and Illness Prevention Program's Personal Protective Equipment Policy and in the Safety Coordinator's Manual. For instance, "because you perform light gas welding, we have selected welding goggles with a protective shade of 3. If you were to perform medium or heavy gas welding, you would need goggles or a face shield and spectacles with a higher protective shade."

#### How does the user properly don, doff, adjust, and wear the PPE?

- Allow the employee to try on different models of the type of eye and/or face protection required and select the most comfortable. Questions to consider when fitting spectacles or goggles to the employee include:

##### Safety Spectacles

- Do the spectacles grip the bridge of the nose comfortably, so the spectacles do not slide down the face but such that the nose is not pinched?
- Does the frame grip the temples comfortably without irritating pressure points?
- Do the spectacles have the correct temple length so that the frames do not pinch the ears but also are not too loose at the ears?

Note: Prescription safety spectacles should be fitted only by qualified optical personnel.

##### Safety Goggles

- Can the straps of the goggles be adjusted so that the goggles fit securely and comfortably across the face?
- Be sure the employee understands how to make adjustments if applicable. For instance, face protectors often have ratcheting headbands.

#### What are the limitations of the PPE?

- The limitations are generally posted directly on the PPE package. For instance, the package for the ENCON 160 series goggles point out that the goggles are not to be used for racket sports, simulated war games, torch welding, torch cutting, electric arc welding, or any other operation which produces harmful levels of infrared radiation. However, the goggles are specifically designed for ultraviolet filtration and chemical splash protection.

**Describe the proper care, maintenance, useful life, and disposal of the PPE.**

### **12.10.3 Appendix C: PPE Training**

- Continuous vision through dirty lenses can cause eye strain. Daily inspection and cleaning of the eye protector with soap and hot water, or with a cleaning solution and tissue, is recommended. Inform the employee of any lens cleaning or anti-fogging materials available.
- Advise the employee to store the eye/face protection away from excessive heat and in such a manner that the frame or rubber will not become warped. Spectacles, in particular, should be given the same care as one's own glasses, since the frame, nose pads, and temples are easily damaged through rough use and rubber goggles become warped through improper storage or exposure to heat.
- Encourage the employee to seek replacement of the eye/face protection if the lenses/shield become scratched to the point of obscuring vision or if the frames become warped to the point of discomfort.
- Slack, worn-out, sweat-soaked, or twisted headbands do not hold the eye protector in proper position. Periodic inspection can determine whether the headband elasticity is reduced to a point beyond proper function.
- PPE that has been previously used should be disinfected before being issued to another employee.

## **12.10.3 Appendix C: PPE Training**

### **Training Guidelines for Head Protection**

The training shall consist of providing the following information at a minimum:

#### **When is the PPE necessary?**

- Share the results of the Hazard Assessment and Personal Protective Equipment Survey. Based on the results of the hazard assessment, describe all work situations in which the employee is required to wear the head protection.

#### **What specific types of PPE are necessary?**

- Describe the process used to select the specific types of head protection required for the different work situations. For instance, "because you may be subject to impact and penetration hazards and also need protection from low voltage conductors up to 2,200 volts, we chose a Class A Helmet." If you were working near overhead high voltage conductors, you would need a Class B helmet.

#### **What are the limitations of the PPE?**

- Class A Helmets are limited to protection against impact and penetration hazards and low-voltage conductors to 2,200 volts.
- Class B Helmets are limited to protection against impact and penetration hazards and high-voltage conductors to 20,000 volts.
- Class C Helmets are limited to protection against impact and penetration hazards only. They do not provide protection from electrical hazards.

#### **How does the user properly don, doff, adjust, and wear the PPE?**

- Be sure the employee understands how to adjust the ratcheting headband within the helmet so the equipment fits correctly. The headbands are adjustable in 1/8" size increments. When the headband is adjusted to the right size, it provides sufficient clearance between the shell and headband.

#### **Describe the proper care, maintenance, useful life, and disposal of the PPE.**

- Manufacturers should be consulted with regard to paint or cleaning materials for their helmets because some paints and thinners may damage the shell and reduce protection by physically weakening it or negating electrical resistance.
- A common method of cleaning shells is dipping them in hot water containing a detergent for at least a minute. Shells should then be scrubbed and rinsed in clear hot water. After rinsing, the shell should be carefully inspected for any signs of damage.
- All components, shells, suspensions, headbands, sweatbands, and any accessories should be visually inspected daily for signs of dents, cracks, penetration, or any other damage that might reduce the degree of safety originally provided.
- Caution the employee that if unusual conditions occur (such as extremely high or low temperatures) or if there are signs of abuse or mutilation of the helmet or any component, the margin of safety may be reduced.

### **12.10.3 Appendix C: PPE Training**

- Helmets should not be stored or carried on the rear-window shelf of an automobile, since sunlight and extreme heat may adversely affect the degree of protection.

## **12.10.3 Appendix C: PPE Training**

### **Training Guidelines for Foot Protection**

The training shall consist of providing the following information at a minimum:

#### **When is the PPE necessary?**

- Share the results of the Hazard Assessment and Personal Protective Equipment Survey. Based on the results of the hazard assessment, describe all work situations in which the employee is required to wear the safety footwear.

#### **What specific type of PPE is necessary?**

- Describe the process used to select the specific type of foot protection required for the work situations. It may be helpful to show the employee the safety shoe catalogs and demonstrate the use of the sole charts and guides. For instance, "because of the type of work you'll be doing, you need a shoe sole which is oil resistant, chip resistant, and slip resistant. The sole of this shoe has excellent ratings in each of these categories."

#### **What are the limitations of the PPE?**

- Safety shoes should only be worn in the environment for which they were designed. For instance, avoid wearing leather shoes or boots when working with caustic chemicals because these substances can eat through the leather right to your foot.

#### **Describe the proper care, maintenance, useful life, and disposal of the PPE.**

- The safety shoe vendors have shoe cleaning solutions and oils available if the employee wishes to prolong the life of the shoe material.
- A good pair of safety footwear typically lasts about 2 years. However, the life of the footwear is greatly dependent on the degree of use to which it is put. Periodic inspection for tears and holes will reveal when it is time to replace safety footwear.
- Advise the employee that if s/he works with chemicals and the boots become torn, don't repair them; throw them out. No repair made would provide enough protection.

## **12.10.3 Appendix C: PPE Training**

### **Training Guidelines for Hand Protection**

The training shall consist of providing the following information at a minimum:

#### **When is the PPE necessary?**

- Share the results of the Hazard Assessment and Personal Protective Equipment Survey. Based on the results of the hazard assessment, describe all work situations in which the employee is required to wear hand protection.

#### **What specific types of PPE are necessary?**

- Describe the process used to select the specific types of hand protection required for the different work situations. For instance, "since you are working with acetone and methyl ethyl ketone, we have selected butyl rubber gloves."

#### **How does the user properly don, doff, adjust, and wear the PPE?**

- Always check rubber gloves for holes before wearing them by inflating them:
  - Twirl the glove and trap air in it, then
  - Place the inflated glove in water or listen for air leakage
  - Leaks are usually found at the finger tips or in between the fingers
- When working with chemicals, gloves should be taped at the top or folded with a cuff to keep liquids from running inside the glove or onto the arm.
- Remove chemical gloves by:
  - washing the gloves first to get the chemical off the gloves; or
  - turning one of the gloves inside out as you remove it, then use the clean inside surface of this glove to remove the other glove.

#### **What are the limitations of the PPE?**

- Gloves must not be worn where there is a danger of the hand protection becoming caught in moving machinery or equipment.
- Gloves must only be used for the purpose they were designed for. For instance, vinyl, rubber, or neoprene gloves are sufficient when working with most chemicals. However, if you work with petroleum-based products, a synthetic glove will be needed. Do not wear metal-reinforced gloves while working with electrical equipment.

#### **Describe the proper care, maintenance, useful life, and disposal of the PPE.**

- Do not touch your face, door knobs, or answer the telephone with chemical gloves on.
- Long fingernails or sharp edged rings can puncture the glove causing exposure to the hazardous material.
- Gloves must be disposed of when inspection reveals pin holes or when they become torn or are no longer serviceable.



### **12.10.3 Appendix C: PPE Training**

- Worn out chemical or body fluid protective gloves generally need to be disposed of in special receptacles designed for that purpose. Advise the employee of the location of such receptacles.

### 12.10.3 Appendix C: PPE Training

#### PERSONAL PROTECTIVE EQUIPMENT QUIZ

Name \_\_\_\_\_

Social Security Number \_\_\_\_\_

Department \_\_\_\_\_

Trainer's Name \_\_\_\_\_

Date \_\_\_\_\_

Describe the locations or tasks in your work area where you must wear personal protective equipment?

What types of personal protective equipment are you required to wear in the work area(s)?  
Be specific. For instance, indicate nitrile gloves as opposed to just gloves or Class A Helmets instead of just hard hats.

For those who wear eye and/or face protection:

Where are the limitations of the eye/face protective equipment described?

How often is cleaning of the lenses recommended?

How should eye/face protective equipment be stored? (Circle one)

- a. Inside my toolbox in amongst all my other tools.
- b. On top of my dashboard in the sun
- c. In an area away from heat, dust, and chemicals where it will not become warped.

Eye and face protection should be replaced when:

- a. The lenses are pitted or scratched to the point of obscuring vision.

### 12.10.3 Appendix C: PPE Training

- b. The head strap has lost its elasticity
- c. The lenses are dirty.
- d. a and b above
- e. all of the above

#### For those who wear head protection:

True or False. Class A and B hard hats are made of insulating material to protect you from electric shock as well as falling objects.

True or False. A hard hat's most important part is its suspension. When the headband is adjusted to the right size, it provides sufficient clearance between the shell and headband.

True or False. It's best to store the hard hat in the rear window of your automobile where it will be handy.

True or False. Some paints or cleaning materials can damage the shell of hard-hats.

How often should the hard hat be inspected for signs of dents, cracks, penetration or other damage that might reduce the degree of safety originally provided?

#### For those who wear foot protection:

True or False. If you work with chemicals and the footwear becomes torn, the boots should be repaired.

True or False. Leather shoes or boots offer good protection against spills of caustic chemicals.

True or False. If you work around exposed electrical wires or connections, you should wear metal-free non-conductive shoes or boots.

#### For those who wear hand protection:

True or False. Gloves should always be worn when working with moving machinery or equipment.

True or False. Vinyl, rubber, or neoprene gloves can be used with petroleum-based products and most other chemicals.

### **12.10.3 Appendix C: PPE Training**

A rubber glove can be tested for pinhole leaks before as follows (circle one):

- a. Fill the glove with water and see if any of the water leaks out.
- b. Visually inspect the glove.
- c. Twirl the glove to trap air in it, then listen for air leakage or dip the glove in water to check for air bubbles.