

---

---

---

---

---

---

---

---



---

---

---

---



---

---

---

---

**Disclaimer**



**Please Note:** The opinions expressed during this presentation are those of the presenter and may not reflect the opinions of the Technical Committee on Fire Investigations or the National Fire Protection Association (NFPA), National Association of Fire Investigators (NAFI), or the International Association of Fire Investigators (IAFI).

---

---

---

---

---

---

---

---



### Fire Investigator Safety Series

The “Fire Investigator Safety Series” will be comprised of four programs that will provide the participants an opportunity to explore the common health and safety hazards found on the fire and explosion investigation scene and during subsequent evidence inspections and other post scene analysis.

---

---

---

---

---

---

---

---

### Fire Investigator Safety Series

Through this exploration process the participant will be able to put control mechanisms in place to eliminate hazards or limit potential exposure to those working on the fire or explosion scene or during post scene activities.



---

---

---

---

---

---

---

---

### Series 4: Safety and Health Programs and Program Management

This session will provide an overview of the Occupational Safety and Health Administration (OSHA, US) Standards that may be applicable while conducting a scene investigation and subsequent post scene analysis. The program will also address the difference between the OSHA Standards and the written program that will be developed for a specific scene. In addition, there will be a discussion of Safety and Health Program Management.

- Date and Time to be Determined

---

---

---

---

---

---

---

---



**Series 3: Personal Protective Equipment (PPE), Selection and Use**

This session will review the broad categories of PPE, the need to utilize the hierarchy of the control mechanisms, the completion of a PPE Assessment in order to identify the most suitable PPE and a summary of the training and other requirements to ensure that the equipment is utilized properly.

---

---

---

---

---

---

---

---

**Series 3: Personal Protective Equipment (PPE), Selection and Use**

**Terminal Outcome**

Provide the participants an overview of the requirements for Personal Protective Equipment (PPE) and an opportunity to review the process of completing a PPE Assessment in order to identify the proper PPE required during a Fire or Explosion Scene Investigation.

---

---

---

---

---

---

---

---

**Enabling Objectives**

Upon completion of this program the participant will be able to:

1. Describe the General Requirements for all PPE.
2. Describe the recommended process for a PPE Assessment.
3. Describe the requirements for Foot Protection.
4. Describe the requirements for Hand Protection.

---

---

---

---

---

---

---

---



### **Enabling Objectives**

Upon completion of this program the participant will be able to:

- 5. Describe the requirements for Eye and Face Protection.
- 6. Describe the requirements for Head Protection.
- 7. Describe the requirements for Respiratory Protection.
- 8. Describe the basic types and components for Fall Protection.

---

---

---

---

---

---

---

---

### **Course Outline**

- A. General Requirements for all PPE, 1910.132
- B. Requirements for Foot Protection, 1910.136
- C. Requirements for Hand Protection, 1910.138
- D. Requirements for Eye and Face Protection, 1910.133
- E. Occupational Noise Exposure, 1910.95
- F. Requirements for Head Protection, 1910.135

---

---

---

---

---

---

---

---

### **Course Outline**

- G. Requirements for Respiratory Protection, 1910.134
- H. Fall Protection, Subpart I Appendix B  
Compliance guidelines for hazard assessment and personal protective equipment selection (non-mandatory) and SubPart M (Construction)
- I. Summary and Closing

---

---

---

---

---

---

---

---



### A. General Requirements for PPE

#### Personal Protective Equipment

29CFR1910.132 [Link](#)



---

---

---

---

---

---

---

---

### 1. Legal Requirements for the selection and use of PPE

- Private Sector (US) Occupational Safety and Health Administration (OSHA)
- Public Sector – OSHA State Plan States  
State OSHA
- Public Sector Employee Plan State – Federal OSHA or a State Agency
- Public Sector Employee – Federal OSHA State  
Exempt from the requirements

---

---

---

---

---

---

---

---

### Fire Service

#### NFPA Standards:

NFPA 1500 (2013) Standard on Fire Department Safety and Health Program



- Do not carry the weight of the law unless they are adopted by the Authority Having Jurisdiction.
- Civil Court: “Standard of Care”

---

---

---

---

---

---

---

---



### 1. Legal Requirements for the Selection and Use of PPE

1910.132 (a) Application. Protective equipment, including personal protective equipment for eyes, face, head, and extremities, protective clothing, respiratory devices, and protective shields and barriers, shall be provided, used, and maintained in a sanitary and reliable condition wherever it is necessary by reason of hazards of processes or environment, chemical hazards, radiological hazards, or mechanical irritants encountered in a manner capable of causing injury or impairment in the function of any part of the body through absorption, inhalation or physical contact.

---

---

---

---

---

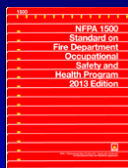
---

---

---

### NFPA 1500

NFPA 1500 (2013) 7.1.1\* The fire department shall provide each member with protective ensembles, ensemble elements, and protective equipment designed to provide protection from hazards to which the member is likely to be exposed and that is suitable for the tasks the member is expected to perform.



---

---

---

---

---

---

---

---

### a. Related PPE Standards

Appendix A



---

---

---

---

---

---

---

---



## Responsibilities

### Employer

- Assess workplace for hazards
- Provide PPE
- Determine when to use
- Provide PPE training for employees

### Employee

- Use PPE in accordance with training received and other instructions
- Inspect daily and maintain in a clean and reliable condition

---

---

---

---

---

---

---

---

---

---

## 2. Controlling Hazards

- Employers must protect employees from hazards such as falling objects, harmful substances, and noise exposures that can cause injury
- Employers must:
  - Use all feasible engineering and work practice controls to eliminate and reduce hazards
  - Use personal protective equipment (PPE) if the controls don't eliminate the hazards.
- PPE is the last level of control!

---

---

---

---

---

---

---

---

---

---

## Engineering Controls

*If . . .*

The work environment can be physically changed to prevent employee exposure to the potential hazard,

*Then . . .*

The hazard can be eliminated with an engineering control

---

---

---

---

---

---

---

---

---

---



### Engineering Controls

*Examples . . .*

- Initial design specifications
- Substitute less harmful material
- Change process
- Enclose process
- Isolate process

---

---

---

---

---

---

---

---

### Work Practice Controls

*If . . .*

Employees can change the way they do their jobs and the exposure to the potential hazard is removed,

*Then . . .*

The hazard can be eliminated with a work practice control

---

---

---

---

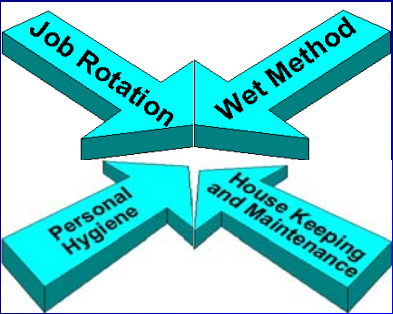
---

---

---

---

### Work Practice Controls - Examples




---

---

---

---

---

---

---

---







### 5. Recommended Process for the Completion of a PPE Assessment

Subpart I Appendix B

Compliance guidelines for hazard assessment and

personal protective equipment selection

(non-mandatory) [Link](#)



---

---

---

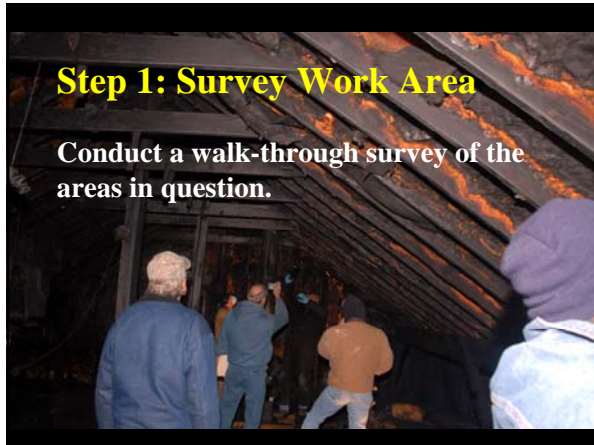
---

---

---

---

---



### Step 1: Survey Work Area

Conduct a walk-through survey of the areas in question.

---

---

---

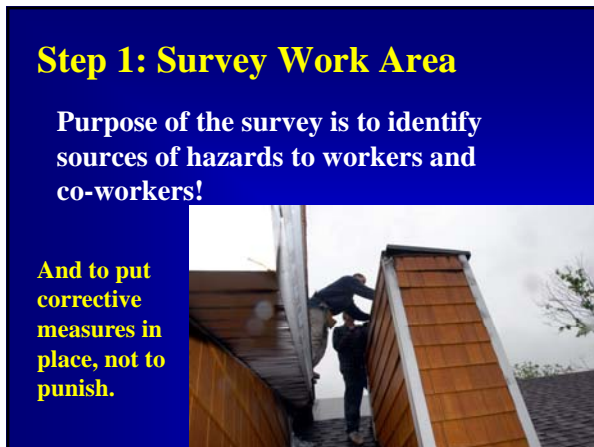
---

---

---

---

---



### Step 1: Survey Work Area

Purpose of the survey is to identify sources of hazards to workers and co-workers!

And to put corrective measures in place, not to punish.

---

---

---

---

---

---

---

---



### Step 1: Survey Work Area

Consideration should be given to the basic hazard categories:

- (a) Impact.
- (b) Penetration.
- (c) Compression (roll-over).
- (d) Chemical.
- (e) Heat.
- (f) Harmful dust.
- (g) Light (optical) radiation.

---

---

---

---

---

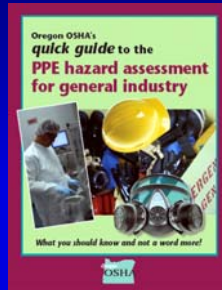
---

---

---

### Tools that May Assist

- Safety Data Sheets
- Review Equipment Owners Manual
- Safety Warnings
- Job Hazard Analysis
- Job Safety Analysis



See Appendix B

---

---

---

---

---

---

---

---

### Step 2: Identify the Sources




---

---

---

---

---

---

---

---



### A. Sources of Physical Hazards

- Slip, Trip, and Fall
- Sharp Surfaces
- Broken Glass
- Environmental Hazards
  - Temperature Extremes
- Fatigue
- Strenuous Physical Activity



---

---

---

---

---

---

---

---

### B. Sources of Structural Hazards



---

---

---

---

---

---

---

---

### C. Sources of Electrical Hazards



---

---

---

---

---

---

---

---





---

---

---

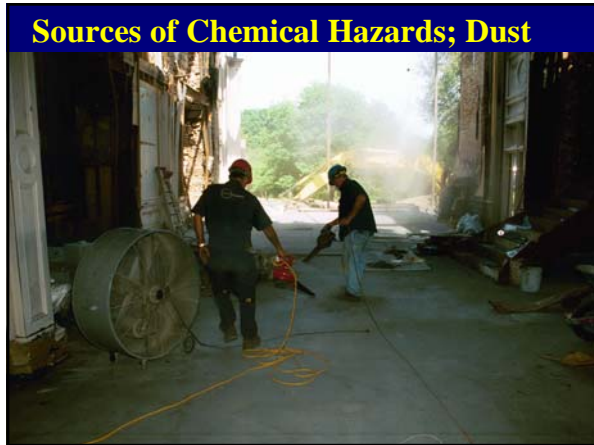
---

---

---

---

---



---

---

---

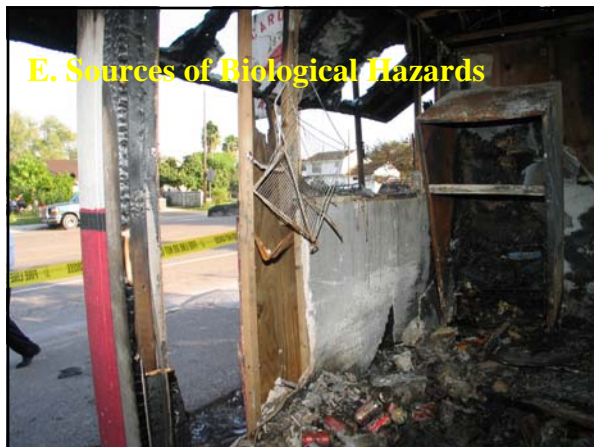
---

---

---

---

---



---

---

---

---

---

---

---

---



### F. Sources of Mechanical Hazards



---

---

---

---

---

---

---

---

### Step 3: Organize Data

- Organize data. Following the walk-through survey, it is necessary to organize the data and information for use in the assessment of hazards.
- The objective is to prepare for an analysis of the hazards in the environment to enable proper selection of protective equipment.

---

---

---

---

---

---

---

---

### Step 3: Organize Data

- Oregon OSHA  
PPE Assessment  
Form [Link](#)

MSWord File available with  
the course resources

**PPE hazard assessment and certification**

Use this sample form to identify hazards and to verify placement in writing that you completed the assessment. Attach it to the survey worksheet.

Having your workplace assessed offers an opportunity to identify safety and health hazards that require personal protective equipment.

**Assessor information**

Department:  Location:

Date conducted by the assessor:  Date of assessment:

Person performing assessment:

Assessment date:

**Report assessment certification**

I certify that I performed the hazard assessment on the form indicated.

Signed by:  Date:

PPE (check the attached assessment worksheet)	Required*	
	Yes	No
Head protection	<input type="checkbox"/>	<input type="checkbox"/>
Hand protection	<input type="checkbox"/>	<input type="checkbox"/>
Eye and face protection	<input type="checkbox"/>	<input type="checkbox"/>
Foot protection	<input type="checkbox"/>	<input type="checkbox"/>
Ear protection	<input type="checkbox"/>	<input type="checkbox"/>
Leg protection	<input type="checkbox"/>	<input type="checkbox"/>
Respiratory protection	<input type="checkbox"/>	<input type="checkbox"/>
Protective clothing	<input type="checkbox"/>	<input type="checkbox"/>

---

---

---

---

---

---

---

---



### Step 4: Analyze the Data

- Having gathered and organized data on a workplace, an estimate of the potential for injuries should be made.
- Each of the basic hazards should be reviewed and a determination made as to the type, level of risk, and seriousness of potential injury from each of the hazards found in the area.
- The possibility of exposure to several hazards simultaneously should be considered.

---

---

---

---

---

---

---

---

### Step 4: Analyze the Data

- Oregon OSHA PPE Assessment Form [Link](#)

PPE hazard assessment and certification	
<b>Full protection</b>	
<ul style="list-style-type: none"> <li>• All employees must be protected from fall hazards when working on unguarded surfaces more than 10 feet above a lower level or at any height above dangerous equipment.</li> <li>• Fall protection systems must be properly installed, inspected, and used according to the criteria in 29 CFR 1926.1053, and 47-1403-0502 in Division 3-300 Construction/PPE Protection.</li> </ul>	
Department: <input type="text"/>	Location: <input type="text"/>
Name included in the assessment: <input type="text"/>	
<b>Potential hazards</b>	
<input type="checkbox"/> Unguarded surfaces more than 10 feet above a lower level or any height above dangerous equipment	
<b>Likelihood of injury without PPE</b>	
<input type="checkbox"/> High	
<input type="checkbox"/> Medium	
<input type="checkbox"/> Low	
<b>Severity of a potential injury without PPE</b>	
<input type="checkbox"/> Minor first aid required	
<input type="checkbox"/> Serious, non-fatal dismembering	
<input type="checkbox"/> DCLIR - fatality dismembering	
<b>PPE required</b>	
<input type="checkbox"/> Personal fall arrest system	
<input type="checkbox"/> Personal fall restraint system	
<input type="checkbox"/> None required	

---

---

---

---

---

---

---

---

### 6. PPE Selection Guidelines

- Become familiar with the potential hazards, the type of protective equipment that is available, and how it will protect you.
- Compare the hazards associated with the environment;

---

---

---

---

---

---

---

---



## 6. PPE Selection Guidelines

c. Select the protective equipment which ensures a level of protection greater than the minimum required to protect employees from the hazards.

d. **Fit the user with the protective device** and give instructions on care and use of the PPE.

---

---

---

---

---

---

---

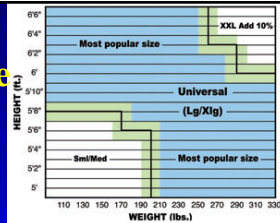
---

## Fitting the Device

• If it does not fit properly, the PPE will not be worn.

• If it does not fit properly, the PPE will not properly protect you.

• If it does not fit properly, the PPE may cause a hazard.



Miller Full Body Harness Sizing Chart

---

---

---

---

---

---

---

---

## 7. Training, 1910.132(f)

- (i) When PPE is necessary;
- (ii) What PPE is necessary;
- (iii) How to properly don, doff, adjust, and wear PPE;
- (iv) The limitations of the PPE; and
- (v) The proper care, maintenance, useful life and disposal of the PPE.

Minimum Content!



---

---

---

---

---

---

---

---





### Training, 1910.132(f)



- The user shall demonstrate an understanding of the training specified,
- The user shall demonstrate the ability to use PPE properly.
- Training is required prior to being allowed to perform work requiring the use of PPE.

---

---

---

---

---

---

---

---

### Re-Training



- Changes in the Workplace
- Equipment Changes
- User does not use properly

---

---

---

---

---

---

---

---

### 8. Reassessment of the Hazards

- It is the responsibility of the safety officer to reassess the workplace hazard situation as necessary, by identifying and evaluating new equipment and processes, reviewing accident records, and reevaluating the suitability of previously selected PPE.

---

---

---

---

---

---

---

---



### 9. Select the most Appropriate PPE

Body Part	Protection
Eye	safety glasses, goggles
Face	face shields
Head	hard hats
Feet	safety shoes
Hands and arms	gloves
Bodies	vests
Hearing	earplugs, earmuffs

---

---

---

---

---

---

---

---

---

---

### 10. Selection Guidelines

- Guidance is provided in Sections 8-11 of Appendix B




---

---

---

---

---

---

---

---

---

---

### 11. Cleaning and Maintenance

- PPE is required to be properly cleaned and maintained.
- 1910.132 (a) and (b)
- Follow Manufacturers Recommendations

**3M** 4051  
page 1 of 1

**Technical Data Bulletin**  
#150, September, 2001 — Reusable Respirators

**Inspection, Cleaning and Storage Procedures for 3M Reusable Respirators**

**Inspection**

1. Inspect the respirator before each use. If the respirator is damaged or worn, do not use it. If the respirator is damaged or worn, it should be replaced or repaired. If the respirator is damaged or worn, it should be replaced or repaired.

**Cleaning**

1. Clean the respirator after each use. Use only mild soap and water. Do not use harsh detergents or solvents. Do not use high-pressure water. Do not use steam cleaning.

**Storage**

1. Store the respirator in a clean, dry, well-ventilated area. Do not store the respirator in a plastic bag or other airtight container. Do not store the respirator near heat, oil, or other contaminants.

**Disposal**

1. Do not dispose of the respirator until it has been properly cleaned and maintained. Do not dispose of the respirator in a landfill or other uncontrolled disposal site.

**Additional Information**

1. For more information, contact 3M at 1-800-451-3039. 2. For more information, contact your local health department or other regulatory agency.

**3M** 4051  
page 1 of 1

---

---

---

---

---

---

---

---

---

---



## 11. Cleaning and Maintenance

### Cleaning and Disinfecting

- According to Manufacturer's Recommendations
- According to Recognized Procedures
- After Each Use




---

---

---

---

---

---

---

---

## 11. Cleaning and Maintenance

### Properly Inspected

- Daily, Prior to Use
- Believed that it may have been damaged during use
- Scheduled

### Damaged

- Removed from Service
- Tagged
- Proper Person Notified

---

---

---

---

---

---

---

---

## 11. Cleaning and Maintenance

### Repaired by a trained and authorized Person

- Manufacturer
- Authorized by the Manufacturer
- Other Trained Person

### After Repair

- Tested
- Returned to Service

---

---

---

---

---

---

---

---



### B. Requirements for Foot Protection, 1910.136



---

---

---

---

---

---

---

---

### When Must Foot Protection be Provided?

When any of these are present:

- 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 ordinary shoes
- Molten metal that might splash on feet
- Hot or wet surfaces
- Slippery surfaces

---

---

---

---

---

---

---

---

### Safety Shoes

Steel and Composite Toes



- Impact-resistant toes and heat-resistant soles protect against hot surfaces common in roofing and paving
- Some have metal insoles to protect against puncture wounds
- May be electrically conductive for use in explosive atmospheres, or nonconductive to protect from workplace electrical hazards

---

---

---

---

---

---

---

---





## Hand Protection

- Condor Hand Protection Fact Sheet – Appendix D




---

---

---

---

---

---

---

---

---

---

---

---

## "The Whys and How's of Hand Protection for Healthier Working Hands"

- Appendix E Discussion of hand protection requirements




---

---

---

---

---

---

---

---

---

---

---

---

## Hand Protection

Double Glove

Inner – Nitrile or Latex

Outer – Cut and Abrasion Protection




---

---

---

---

---

---

---

---

---

---

---

---





### D. Requirements for Eye and Face Protection, 1910.133




---

---

---

---

---

---

---

---

### Eye and Face Protection, 1910.133

Ensure that each affected employee uses appropriate eye or face protection when exposed to eye or face hazards from:

- Flying particles,
- Molten metal,
- Liquid chemicals, acids or caustic liquids,
- Chemical gases or vapors,
- Potentially injurious light radiation




---

---

---

---

---

---

---

---

### Eye and Face Protection

- Appendix F



**QuickTips Safety**  
Personal Protective Equipment (PPE) Requirement: Eye & Face Protection  
Code: TP-022

**Introduction**

According to Personal Protective Equipment (PPE) requirements, eye injuries are very common. Thousands of eye accidents happen each day and one in 10 require medical attention or even vision loss.

It is essential that using the correct eye protection could prevent the severity or even prevent 90% of eye injuries.

**Personal Protective Equipment (PPE) Requirements**

General personal protective equipment (PPE) requirements are addressed in Title 29 Code of Federal Regulations (CFR), 1910.132 - Occupational Safety and Health Standards.

"These eye protection including personal protective equipment for eye, face, head and respiratory protection including equipment, devices, and protective shields and barriers shall be provided, used and maintained in a manner and relative condition whenever it is necessary to protect an employee from eye or face injury. This includes, but is not limited to, protection from flying objects, molten metal, liquid chemicals, acids or caustic liquids, chemical gases or vapors, and potentially injurious light radiation."

29 CFR 1910.133

**Eye and face protection requirements are outlined in 29 CFR 1910.133:**

- Employees must ensure that each affected employee uses appropriate eye or face protection when exposed to eye or face hazards from flying particles, molten metal, liquid chemicals, acids or caustic liquids, chemical gases or vapors, or potentially injurious light radiation.
- Employees must ensure that each affected employee uses eye protection that provides eye protection when there is a hazard from flying objects. This includes eye protection that is in compliance with the personal protective equipment (PPE) requirements.
- Employees must ensure that each affected employee who wears prescription lenses while engaged in work that presents eye hazards from eye protection that incorporates the prescription in its design, or wears eye protection that will fit over the prescription lenses, wears corrective lenses that provide the proper protection of the prescription lenses or that protective lens.

---

---

---

---

---

---

---

---



## Eye Protection Criteria for Selection



- Protects against specific hazard(s)
- Comfortable to wear
- Does not restrict vision or movement
- Durable and easy to clean and disinfect
- Does not interfere with the function of other required PPE

---

---

---

---

---

---

---

---

---

---

---

---

## Eye Protection for Employees Who Wear Eyeglasses

Ordinary glasses do *not* provide the required protection



Proper choices include:

- Prescription glasses with side shields and protective lenses
- Goggles that fit comfortably over corrective glasses without disturbing the glasses
- Goggles that incorporate corrective lenses mounted behind protective lenses

---

---

---

---

---

---

---

---

---

---

---

---

## Eye Protection

- Lens Selection
- Appendix G




---

---

---

---

---

---

---

---

---

---

---

---





## Face Shields

- Full face protection
- Protects face from dusts and splashes or sprays of hazardous liquids
- May or may not protect from impact hazards
- Wear safety glasses or goggles underneath




---

---

---

---

---

---

---

---

---

---

---

---

## Eye and Face Protection




---

---

---

---

---

---

---

---

---

---

---

---

## Face Shield Protection

### Appendix H



**QuickTips** Safety

**Face Shield Protection**

Quick Tip #173

Face shield protection is an important part of personal protective equipment (PPE). OSHA regulation 29 CFR 1910.133 gives the manufacturers the responsibility to follow the appropriate use and limitations of the shield and protection device. OSHA refers to ASTM for proper manufacturing standards for the shield as well as other eye and face protective equipment. The manufacturing standard is ASTM F2171 and is titled, "Standard Personal Protective Equipment for Occupational and Educational Eye and Face Protection." The ASTM manufacturing standard for face shields includes testing for impact and splash safety. Face shields are primarily designed to protect the face from flying objects, molten metals, liquid chemical splashes, bodily fluids, and potentially aggressive light radiation.

The most common ASTM standard for eye and face protection is ASTM Z87.1 - 2010. Changes for the 2010 revision include the following:

- More emphasis on specific testing as opposed to generic type
- Impact standards were changed from "high impact" and "high impact" (ASTM standard) to "high impact" and "medium impact" (ASTM standard)
- Compliance with both test methods is required
- New testing for splash, that will face dust

The ASTM 2010 standard states that the shields are considered secondary eye protection and must be used in conjunction with safety glasses or goggles. The 2010 standard does not distinguish between primary and secondary eye protection. Other manufacturers of face shields suggest using safety glasses or goggles underneath the shield for additional eye protection.

OSHA revises the revised 2010 standard. OSHA also revises the 2910 and 1910.133 (PPE). ASTM standards for eye and face protection. In revising the 2010 and 1910 standards, employers are allowed to continue to use eye and face shield protection products meeting the 2010, 2001 or 1910.133 (PPE) standards.

**Face Shield Visor Materials**

Face shield visors are constructed from several types of materials. These materials include polycarbonate, polyethylene, acrylic, and PETG. Each material has specific properties. It is important to understand the properties of the material used in the visor.

**Polycarbonate** - Polycarbonate material provides the best impact resistance and best resistance of all visor materials. Specialty polycarbonate visors are also used for eye protection and high heat and radiation protection. Polycarbonate also provides chemical splash protection and

---

---

---

---

---

---

---

---

---

---

---

---




---

---

---

---

---

---

---

---

---

---

### Hearing Conservation




**Table G-16. Permissible Noise Exposures<sup>1</sup>**

Duration per day, hours	Sound level dBA show response
8	90
6	92
4	95
3	97
2	100
1½	102
1	105
½	110
¼ or less	115

1. When the daily noise exposure is composed of two or more periods of noise exposure of different levels, their combined effect should be considered, rather than the individual effect of each. If the sum of the following fractions:  $C_1/T_1 + C_2/T_2 + \dots + C_n/T_n$  exceeds unity, then the actual exposure should be considered to exceed the limit value.  $C_n$  indicates the total time of exposure at a specified noise level, and  $T_n$  indicates the total time of exposure permitted at that level.  
Exposure to impulsive or impact noise should not exceed 140 dB peak sound pressure level.

**Course Resources**

---

---

---

---

---

---

---

---

---

---

### When Must Hearing Protection be Provided?

After implementing engineering and work practice controls

When an employee's noise exposure exceeds an 8-hour time-weighted average (TWA) sound level of 90 dBA

Action Level 85dBA

---

---

---

---

---

---

---

---

---

---





**Noise Level Exposure Limits**



**Damage Occurs:**

Source: NIOSH

Noise Level, dB	Time (hours, minutes)
80	25:00
85	8:00
90	2:30
95	0:47
100	0:15
105	0:04
110	0:01

---

---

---

---

---

---

---

---

**Examples of Hearing Protectors**

Earmuffs      Earplugs      Canal Caps






---

---

---

---

---

---

---

---

**E. Requirements for Head Protection, 1910.135**





---

---

---

---

---

---

---

---



## Causes of Head Injuries



- Falling objects such as tools
- Bumping head against objects, such as pipes or beams
- Contact with exposed electrical wiring or components

---

---

---

---

---

---

---

---

---

---

## Requirements for Head Protection, 1910.135

### Appendix J




---

---

---

---

---

---

---

---

---

---

## Selecting the Right Hard Hat

Sec. 1910.135 Head protection. \* \* \* \* (b) Criteria for head protection.

(1) Head protection must comply with any of the following consensus standards:

- (i) Z89.1-2003, "American National Standard for Industrial Head Protection," which is incorporated by reference in Sec. 1910.6;
- (ii) ANSI Z89.1-1997, "American National Standard for Industrial Head Protection," which is incorporated by reference in Sec. 1910.6; or
- (iii) ANSI Z89.1-1986, "American National Standard for Personnel Protection--Protective Headwear for Industrial Workers--Requirements," which is incorporated by reference in Sec. 1910.6.

(2) Head protection devices that the employer demonstrates are at least as effective.....

---

---

---

---

---

---

---

---

---

---



### Selecting the Right Hard Hat

- ANSI Z-89.1 1997

Changed the classifications.

**Type I Hard Hats** - intended to reduce the force of impact resulting from a blow to the top of the head.

**Type II Hard Hats** - designed to provide protection against both side impact and blows to the top of the head. Locations in your workplace requiring Type II protection will be determined by your Safety Management.




---

---

---

---

---

---

---

---

---

---

### Selecting the Right Hard Hat

ANSI Z87.1-1997 also changed the designations for the 3 electrical protection classes that apply to both Type I and Type II hard hats. Testing requirements remain the same.

#### Classifications under old and new standards

Z89.1 1986	Z89.1 1997	Application	Test Voltage
A	G	General	2,200 Volts
B	E	Electrical	20,000 Volts
C	C	Conductive	Not Tested




---

---

---

---

---

---

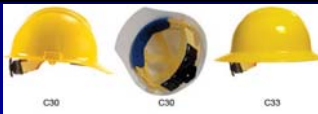
---

---

---

---

### Hard Hat Issues!



- Shelf Life - About 5 years (UV)
- MSA Suspension 1 Year
- No Solvents
- No Paints
- No Stickers

*Check MFG's Recommendations*

- ANSI Z89.1-1969, Falling/Flying
- ANSI Z89.2-1971, Electrical

---

---

---

---

---

---

---

---

---

---



### Hard Hat Bill Direction

- Letter of Interpretation 4-2002
- In the July 22, 1992, letter to Mr. Artie Scruggs, OSHA stated:  
*ANSI only tests and certifies hard hats to be worn with the bill forward [;] hard hats worn with the bill to the rear would not be considered reliable protection and would not meet the requirements of 29 CFR 1926.100(a) and (b) unless the hard hat manufacturer certifies that this practice meets the ANSI Z89.1-1969 requirements.*

This continues to be OSHA's interpretation of this standard. Additionally, note that a manufacturer may certify that it would be acceptable to wear the hard hat with the bill to the rear when the hard hat liner is turned/reversed.

---

---

---

---

---

---

---

---



### F. Requirements for Respiratory Protection, 1910.134

---

---

---

---

---

---

---

---

### NFPA 1852, Standard on Selection, Care, and Maintenance of Open-Circuit Self-Contained Breathing Apparatus (SCBA)

- 4.1 General.
  - 4.1.1 Emergency services organizations shall have a written respiratory protection program that addresses the respiratory protection for the members of that organization.

---

---

---

---

---

---

---

---





**Respiratory Protection Program,  
1910.134(c)(1)**

Where respirators are required you need:

- Written program
- Worksite-specific procedures

---

---

---

---

---

---

---

---

**Required elements include:**

- (i) **Procedures for selecting respirators** for use in the workplace;
- (ii) **Medical evaluations** of employees required to use respirators;
- (iii) **Fit testing** procedures for tight-fitting respirators;
- (iv) **Procedures for proper use of respirators** in routine and reasonably foreseeable emergency situations;

---

---

---

---

---

---

---

---

**Required elements include:**

- (v) Procedures and schedules for **cleaning, disinfecting, storing, inspecting, repairing, discarding,** and otherwise maintaining respirators;
- (vi) Procedures to **ensure adequate air quality, quantity, and flow** of breathing air for atmosphere-supplying respirators;
- (vii) **Training of employees in the respiratory hazards** to which they are potentially exposed during routine and emergency situations;

---

---

---

---

---

---

---

---





### Required elements include:

(viii) Training of employees in the proper use of respirators, including putting on and removing them, any limitations on their use, and their maintenance; and

(ix) Procedures for regularly evaluating the effectiveness of the program.

---

---

---

---

---

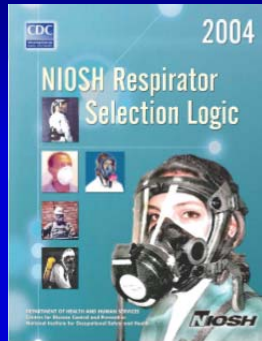
---

---

---

### Selection of Respirators, (d)

- Course Materials
- Current Edition
- Read the Document Prior to Use



---

---

---

---

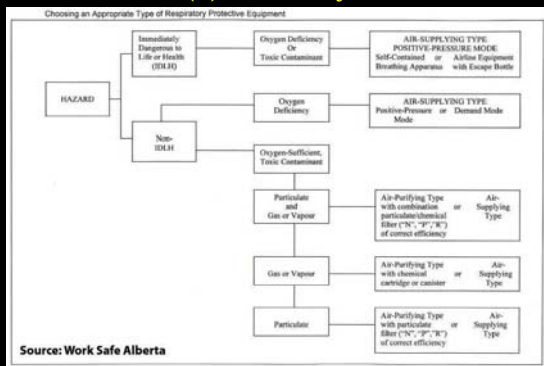
---

---

---

---

### Respirator Selection, 1910.134 (d) Summary



---

---

---

---

---

---

---

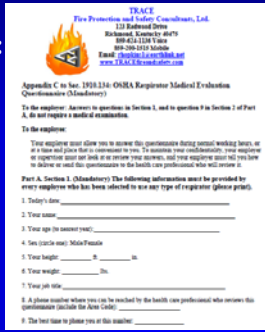
---



## Medical Evaluations (e)

1910.134 Appendix C:  
OSHA Respirator  
Medical Evaluation  
Questionnaire  
(mandatory)

[Link](#)



---

---

---

---

---

---

---

---

---

---

## Medical Screening



[Online Respirator Medical Evaluations](#)

3M facilitates a convenient method for employers to obtain medical evaluation of respirator wearers as required by the OSHA Respiratory Protection Standard, 29 CFR 1910.134.

---

---

---

---

---

---

---

---

---

---

## Fit Testing (f)

(2) The employer shall ensure that an employee using a tight-fitting facepiece respirator is fit tested prior to initial use of the respirator, whenever a different respirator facepiece (size, style, model or make) is used, and **at least annually thereafter.**



---

---

---

---

---

---

---

---

---

---



## Fit Testing (f)

- Appendix K




---

---

---

---

---

---

---

---

---

---

---

---

## Protection Factors

$$\text{Maximum Exposure Concentration} = \text{Protection Factor} \times \text{Permissible Exposure Limit (PEL)}$$

Respirator Type                      Assigned Protection Factor

- Dust Mask                                      5
- Quarter Face APR                            5
- Half Face APR                                10
- Full Face APR                                50
- PAPR    50
- SCBA/Pressure Demand                    10,000

---

---

---

---

---

---

---

---

---

---

---

---

## Maintenance and Care of Respirators (h)

1910.134 Appendix B-2 Respirator cleaning procedures (mandatory)

The employer as an alternative may use the cleaning recommendations provided by the manufacturer of the respirators used by their employees, provided such procedures are as effective as those listed here in Appendix B- 2.




---

---

---

---

---

---

---

---

---

---

---

---



### Cleaning and Disinfecting

- Single User
- Multiple User
- Fit Testing




---

---

---

---

---

---

---

---

### Cleaning and Disinfecting



- Remove filters, cartridges, or canisters.
- Wash components in warm (43 °C [110 °F] maximum) water with a mild detergent or with a cleaner recommended by the manufacturer.
- Rinse components thoroughly in clean, warm (43 °C [110 °F] maximum), preferably running water. Drain.

---

---

---

---

---

---

---

---

### Cleaning and Disinfecting

- When the cleaner used does not contain a disinfecting agent, respirator components should be immersed for two minutes in one of the following:
  - Hypochlorite solution (50 ppm of chlorine) made by adding approximately one milliliter of laundry bleach to one liter of water at 43 °C (110 °F); or,
  - Aqueous solution of iodine (50 ppm iodine) made by adding approximately 0.8 milliliters of tincture of iodine (6-8 grams ammonium and/or potassium iodide/100 cc of 45% alcohol) to one liter of water at 43 °C (110 °F); or,

---

---

---

---

---

---

---

---



### Cleaning and Disinfecting

3. Other commercially available cleansers of equivalent disinfectant quality when used as directed, if their use is recommended or approved by the respirator manufacturer.

---

---

---

---

---

---

---

---

### Cleaning and Disinfecting

E. Rinse components thoroughly in clean, warm (43 °C [110 °F] maximum), preferably running water. Drain. The importance of thorough rinsing cannot be overemphasized. Detergents or disinfectants that dry on facepieces may result in dermatitis. In addition, some disinfectants may cause deterioration of rubber or corrosion of metal parts if not completely removed.

F. Components should be hand-dried with a clean lint-free cloth or air-dried.

---

---

---

---

---

---

---

---

### N 95 Respirator Use



---

---

---

---

---

---

---

---



## G. Requirements for Fall Protection Equipment

- Guarding floor and wall openings and holes, 1910.23
- Fall Protection Equipment and Systems, Subpart M Fall Protection, Construction Industry Standards
- Subpart D Walking Working Surfaces, General Industry Standards is under revision.

---

---

---

---

---

---

---

---

---

---

## Fall Protection Requirements

- Appendix L




---

---

---

---

---

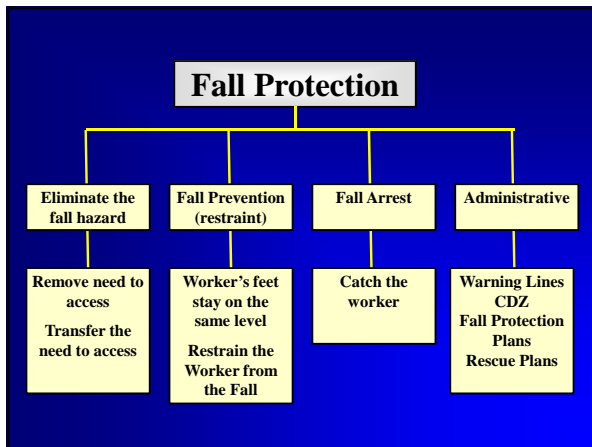
---

---

---

---

---




---

---

---

---

---

---

---

---

---

---



### Trigger Heights for Fall Protection\*

- 4 Feet, General Industry
- 6 Feet, Construction Industry
- 10 Feet, Scaffolding

Note: Check State Plan State Requirements or other regulatory requirements

---

---

---

---

---

---

---

---

### Fall Protection Options

#### General

- Guardrail systems
- Safety net systems
- Personal fall arrest systems
- Warning line systems

---

---

---

---

---

---

---

---

### Guardrail Systems

- Top rail, mid-rail, and toe board
- Withstand a minimum force



---

---

---

---

---

---

---

---



### Safety Net Systems

- Installed a maximum of 30' below working level
- 400 pound drop test or certified by employer or CP
- Extends sufficiently from outer edge
- Inspected weekly
- Objects removed within shift
- Border rope strength of 5000 pounds




---

---

---

---

---

---

---

---

### Personal Fall Arrest System

- Anchorage
- Connectors
- Lanyard
- Full Body Harness




---

---

---

---

---

---

---

---

### Calculation of Total Fall Distance

- Freefall = 6 feet maximum
- Deceleration Distance = 3.5 feet maximum
- Lifeline elongation = 2 feet maximum
- Total fall before stopping = 11.5 feet
- Portion of body landing below attachment point approximately 5 feet
- Total clearance below required to avoid contacting lower level may be as great as 16.5 feet or more!




---

---

---

---

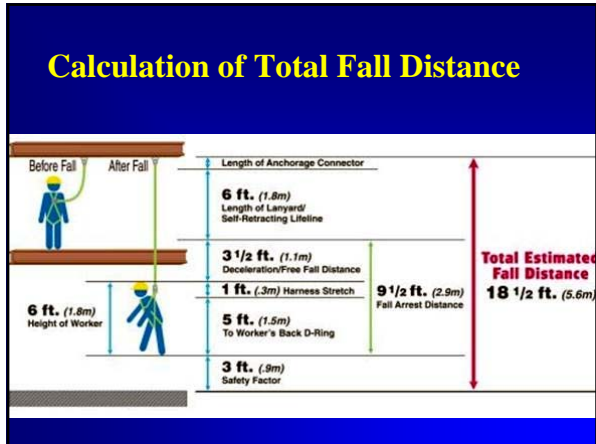
---

---

---

---






---

---

---

---

---

---

---


---

---

---

### Warning Line Systems

- Erected around all sides of roof
- Erected at least six feet from edge if no mechanical equipment is used.
- 10 feet if mechanical equipment is used.




---

---

---

---

---

---

---

---


---

---

### H. PPE Summary

**PPE is the Last Resort!**

- Engineering Controls
- Administrative Controls
- PPE



Cowboy after O.S.H.A.

---

---

---

---

---

---

---

---

---

---



### PPE Selection



Based on a Survey of the Work Site

- Based on the Hazards Identified
- Based on the Level of Hazards Identified
- Select the PPE that is most effective
- Insure that the PPE is Used

---

---

---

---

---

---

---

---

### PPE Fit

- If it does not fit properly, the PPE will not be worn.
- If it does not fit properly, the PPE will not properly protect you.
- If it does not fit properly, the PPE may cause a hazard.

---

---

---

---

---

---

---

---

### PPE Care and Maintenance

- Properly Inspected, Prior to Use
- Cleaned and Inspected, After Use
- Maintained by a Properly Trained and Equipped Technician
- Remove, Tag, and Notify the Proper Person if Damaged

---

---

---

---

---

---

---

---



## PPE Training

- Properly Trained Prior to Use
- Training Materials
  - OSHA Requirements
  - Manufacturers Requirements
  - Site Specific Requirements
  - Manufacturer Resources

---

---

---

---

---

---

---

---

## PPE Use

- Used Appropriately
- Used within Limitations



---

---

---

---

---

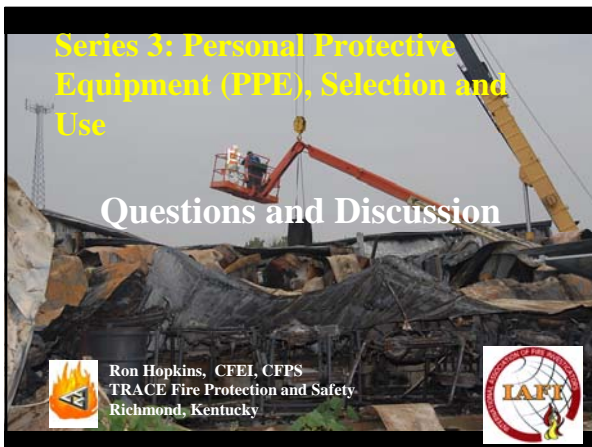
---

---

---

## Series 3: Personal Protective Equipment (PPE), Selection and Use

### Questions and Discussion



---

---

---

---

---

---

---

---



---

---

---

---

---

---

---

---



---

---

---

---

---

---

---

---