Eye and Face Protection

Thousands of people are blinded each year from work-related eye injuries. According to the Bureau of Labor Statistics (BLS), nearly three out of five workers are injured while failing to wear eye and face protection.






EYE PROTECTION






Why should we be concerned with Eye Safety?

- Eye injuries of all types occur at the rate of about 2000 per day.
- 10% to 20% of these injuries result in temporary or permanent vision loss.
- Three out of five people who receive sustainable eye injuries were not wearing eye protection.






Eye and Face Protection

Are you in danger of becoming a statistic?

Are you wearing the proper protective equipment?

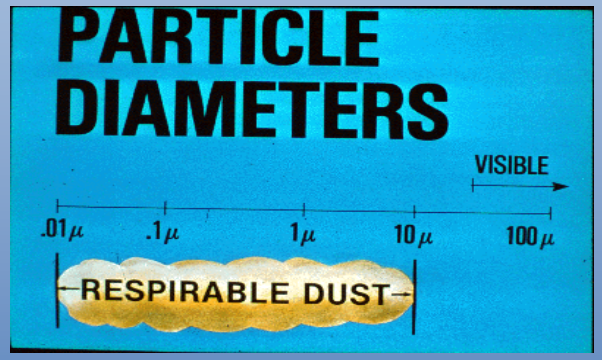
What is your employer's responsibility?

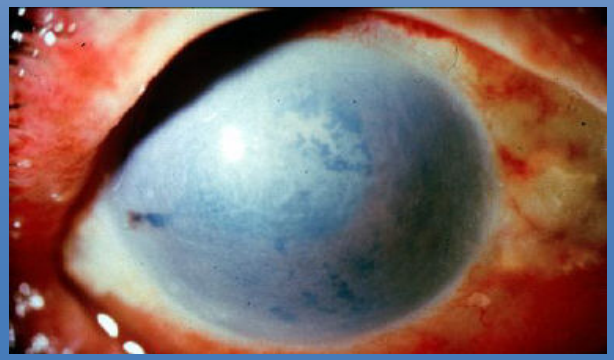





What are some causes of eye injuries?

- Flying objects – A survey conducted by the Bureau of Labor Statistics, found that about 70% of eye injuries were caused by flying debris or falling objects
- Contact with Chemicals
- Misuse of tools: improper guards, poor maintenance, poor safety habits










OSHA Requirements

- OSHA Standards
- Training and Qualifications
- Criteria for PPE
- Contacts and Prescription (Rx) Lenses
- Protecting Employees from Workplace Hazards






OSHA Standards

The following OSHA standards provide mandatory requirements and compliance assistance for employers when selecting proper eye and face protection:

- 1910.132 - General requirements
- 1910.133 - General Industry
- 1915.153 - Maritime
- 1926.102 - Construction
- 1910.252 - Welding, Cutting, and Brazing






Training and Qualification

1910.132(f), Employees shall be trained to know at least the following:

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






Training and Qualification

Retraining is required, but not limited to, the following situations:

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






PPE Requirements

Eye and face protection must comply with the American National Standards Institute, ANSI Z87.1-1989 if purchased after July 5, 1994, or ANSI Z87.1-1968 if purchased before July 5, 1994.

- 1910.133(b)(1)
- 1915.153(b)
- 1926.102(a)






PPE Requirements

Protectors must:

- Provide adequate protection against the particular hazards for which they are designed [1926.102(a)(6)];
- Be of safe design and construction for the work to be performed [1910.132(c)];
- Be reasonably comfortable [1926.102(a)(6)(ii)];
- Fit snugly and shall not unduly interfere with the movements of the wearer [1926.102(a)(6)(iii)];
- Be durable [1926.102(a)(6)(iv)];
- Be capable of being disinfected [1926.102(a)(6)(v)];
- Be easily cleanable [1926.102(a)(6)(vi)];
- Be distinctly marked [1910.133(a)(4), 1926.102(a)(7)]






Contacts and Rx Lenses

Employers must ensure that employees who wear prescription (Rx) lenses or contacts use PPE that incorporates the prescription or use eye protection that can be worn over prescription lenses.

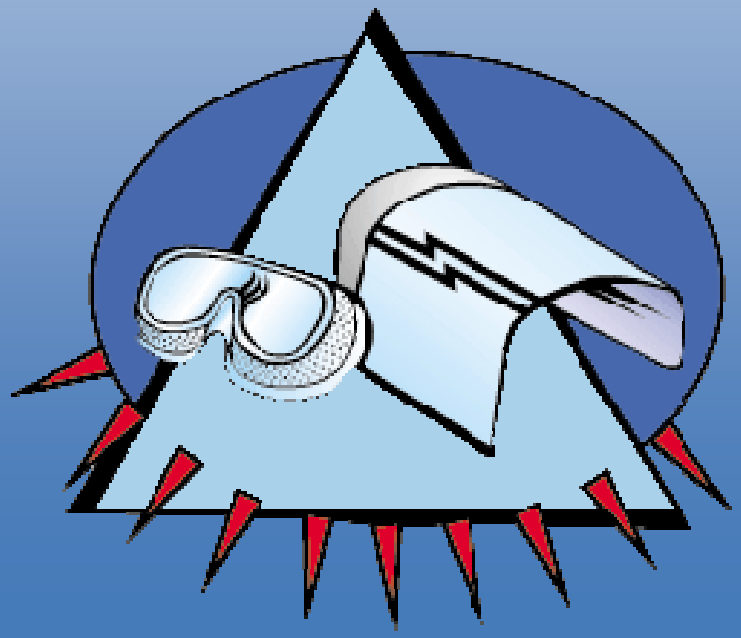
- 1910.133(a)(3)
- 1915.153(a)(3)
- 1926.102(a)(3)






Protecting Employees from Workplace Hazards

Employees must be provided with eye and face protection equipment when machines or operations present potential eye or face injury from physical, chemical, or radiation agents. [1926.102(a)(1)]



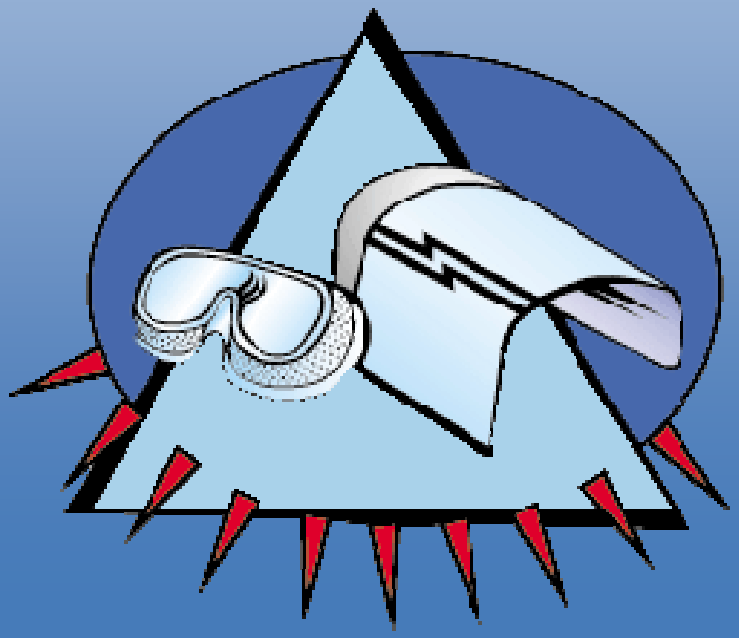





Protecting Employees from Workplace Hazards

PPE devices alone should not be relied on to provide protection against hazards, but should be used in conjunction with guards, engineering controls, and sound manufacturing practices.

(1910 Subpart I Appendix B)








Selecting PPE for the Workplace

The employer must assess the workplace and determine if hazards that necessitate the use of eye and face protection are present, or are likely to be present, before assigning PPE to workers.

A hazard assessment determines the risk of exposure to eye and face hazards, including emergency situations.

- 1910.132(a)
- 1915.153(a)(1)
- 1910.133(a)(1)
- 1926.153(a)(1)






Hazard Assessment

Hazard Type	Hazard Type	Common related tasks
Impact	Flying objects such as large chips, fragments, particles, sand, and dirt.	Chipping, grinding, machining, masonry work, wood working, sawing, drilling, riveting, sanding, etc.
Heat	Anything emitting extreme heat.	Furnace operations, pouring, casting, hot dipping, welding, etc.
Chemicals	Splash, fumes, vapors, and irritating mists.	Acid and chemical handling, degreasing, plating, and working with blood.
Dust	Harmful dust.	Woodworking, buffing, and general dusty conditions.
Optical Radiation	Radiant energy, glare, and intense light	Welding, torch-cutting, -brazing, -soldering, and laser work.

Impact Hazards: Safety Spectacles

- Safety spectacles are intended to shield the wearer's eyes from impact hazards such as flying fragments, objects, large chips, and particles.
- Workers are required to use eye safety spectacles with side shields when there is a hazard from flying objects.

1910.133(a)(2) 1915.153(a)(2)






Safety Glasses

Safety glasses should meet the following criteria:

- ANSI Z87.1 labeling
- complete eye coverage
- side guards
- brightly colored frames to ensure compliance
- proper fit
- retention cords






Impact Hazards: Safety Goggles

- Safety goggles are intended to shield the wearer's eyes from impact hazards such as flying fragments, objects, large chips, and particles.
- Goggles fit the face immediately surrounding the eyes and form a protective seal around the eyes. This prevents objects from entering under or around the goggles.






Safety Goggles

Safety goggles should meet the following criteria:

- ANSI Z87.1 labeling
- high-quality and heavy-duty construction
- proper fit, rapid adjustment
- NFPA 1971 compliance (if on structural firefighting helmet)
- goggle spectacle kit.






Impact Hazards: Face Shields

- Face shields are intended to protect the entire face, or portions thereof, from impact hazards such as flying fragments, objects, large chips, and particles.
- When worn alone, face shields *do not* protect employees from impact hazards. Use face shields in combination with safety spectacles or goggles for additional protection.






Heat Hazards: Safety Spectacles

Safety spectacles with side shields are used as primary protection to shield the eyes from heat hazards.

To adequately protect the eyes and face from high temperature exposure, use safety spectacles in combination with a heat-reflective face shield.

Heat Hazards: Safety Goggles

Safety goggles are used as primary protection to shield the eyes from heat hazards. Goggles form a protective seal around the eyes, preventing objects or liquids from entering under or around the goggles. This is especially important when working with or around molten metals that may splash.






Heat Hazards: Face Shields

Heat-reflective and wire-screen face shields are intended to shield the entire face from a range of heat hazards.

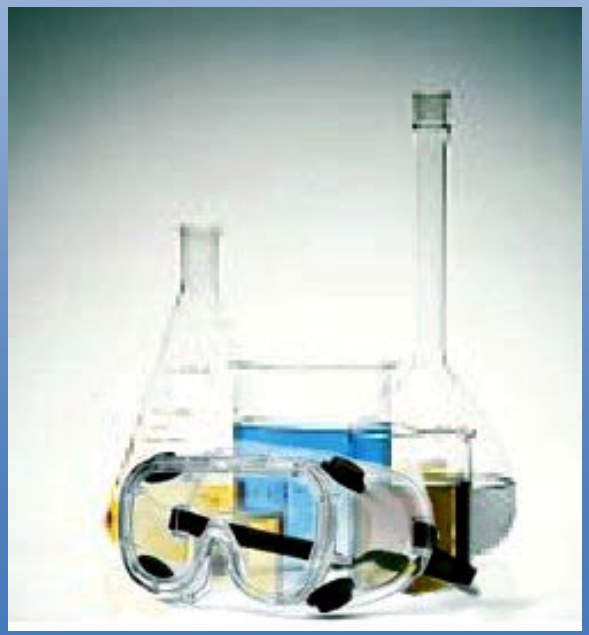
Face shields are considered secondary protectors to be used *in addition* to primary protection such as safety spectacles or goggles.






Chemical Hazards: Safety Goggles

Safety goggles protect the eyes, eye sockets, and the facial area immediately surrounding the eyes from a variety of chemical hazards. Goggles form a protective seal around the eyes, preventing objects or liquids from entering under or around the goggles.








Chemical Hazards: Face Shields

Face shields are intended to protect the entire face from a variety of chemical hazards.

All face shields are considered secondary protection and must be used *in addition* to safety goggles to provide adequate protection.






Dust Hazards: Safety Goggles

Goggles form a protective seal around the eyes, preventing nuisance dust from entering under or around the goggles. Ventilation should be adequate, but well protected from dust entry.






Optical Radiation: Filter Lenses

Wearing protection with the correct filter shade number is required to protect workers' eyes from optical radiation. When selecting PPE, consider the type and degree of radiant energy in the workplace.

- 1910.133(a)(5) -General Industry
- 1915.153 (a)(4) -Maritime
- 1926.102(b)(1) -Construction






Optical Radiation: Welding

Welding helmets are secondary protectors intended to shield the eyes and face from optical radiation, heat, and impact.

Use welding helmets *in addition* to primary protection such as safety spectacles or goggles to provide adequate protection.






Optical Radiation: Lasers

Workers with exposure to laser beams must be furnished suitable laser safety goggles which will:

- Protect for the specific wavelength of the laser
- Be of optical density adequate for the energy involved

[1926.102(b)(2)]






Optical Radiation: Glare

Control Glare with:

- Special-Purpose Spectacles that include filter or special-purpose lenses to provide protection against eye strain.
- Changes in your work area or lighting
- Tinted eyeglass lenses or visor-type shade





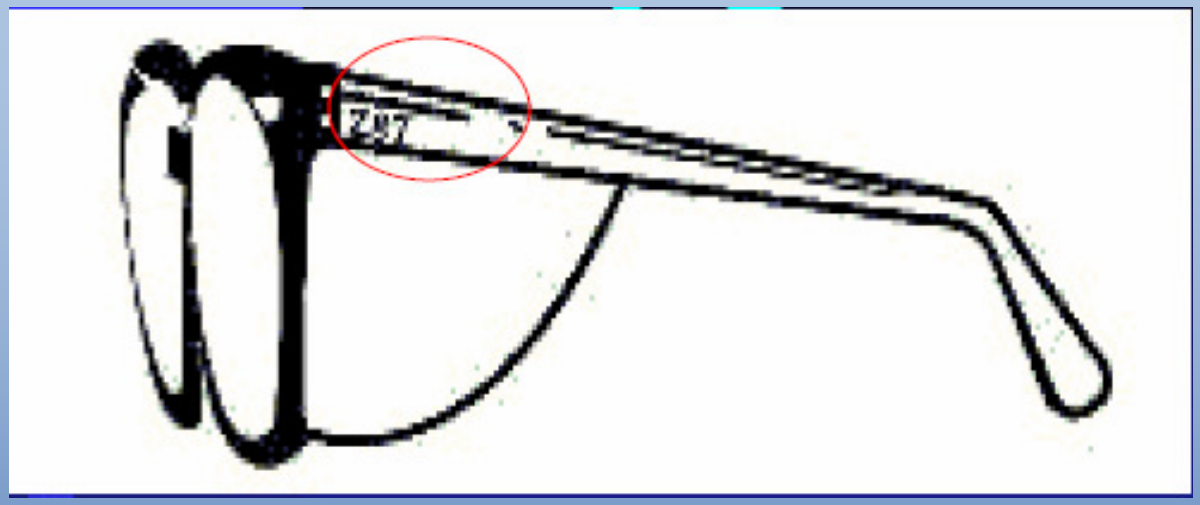

Eye and Face Protection

When employees are trained to work safely they should be able to anticipate and avoid injury from job-related hazards.






Z-87



- As of July 5,1994, all glasses must meet the minimum standards set forth by the American National Standards Institute.
- Approved lenses are marked by the manufacturer
- Z87 will be on all other major components
- Z87 indicates that it has met the safety requirements






ANSI

- **American National Standards Institute, *Practice for Occupational and Educational Eye and Face Protection Standard* Z87.1-1979 (ANSI Z87.1)**
- Both OSHA and NFPA 1500 standards reference ANSI Z87.1 as the benchmark standard for occupational eye and face protection.
- Sections 9&10 include the specific standards for evaluating factors such as impact resistance, lens thickness, projectile penetration, and optical quality.
- Departments should only use protective eyewear marked "Z87"; this indicates that the product has met ANSI Z87.1 standards.
- When NFPA 1500 standards reference ANSI Z87.1, they specifically require *primary* eye protection. ANSI Z87.1 is very clear in its description of primary versus secondary eye protection:






What to do in case of an eye injury

- If you get dust, a wood chip or another small particle in your eye, look down and flush it out with eyewash solution. Use water if eyewash solution is not available
- If a pesticide gets into your eyes, immediately use a portable eye flush dispenser or call for help if needed to get to an eyewash station
- Flush your eye with eyewash solution for 15 minutes. Have someone call for medical attention while you are flushing
- The Material Safety Data sheet and label will give first aid instructions






NFPA

- **Primary Protector** – A device which may be worn alone or in conjunction with a secondary protector.
- **Secondary Protector** – A device which shall be worn only in conjunction with a primary protector.
- **Faceshield** - A protective device commonly intended to shield the wearer's face, or portions thereof, in addition to the eyes, from certain hazards. Faceshields are secondary protectors and shall be used only with primary protectors.
- **Goggle** - A protective device intended to fit the face immediately surrounding the eyes to shield the eyes from a variety of hazards.While goggles are primary protectors and may be used alone, they may also be used in conjunction with the other protectors.






NFPA 1500

- ***Fire Department Occupational Safety and Health Program*, 1997 edition**
- NFPA 1500 is the U.S. Fire Service's official guide for procedures and proper equipment use. Section 5-10 *Eye and Face Protection* sends a clear message that appropriate primary eye protection must be provided and worn:
- 5-10.1 Primary face and eye protection appropriate for a given specific hazard shall be provided and used by members exposed to that specific hazard.
- Such primary face and eye protection shall meet the requirements of ANSI Z87.1.






NFPA 1500

- 5-10.2 The full facepiece of SCBA shall constitute face and eye protection when worn.
- SCBA that has a facepiece-mounted regulator that, when disconnected, provides a direct path for flying objects to strike the face or eyes, shall have the regulator attached in order to be considered eye and face protection.
- MSA masks do not have a clear pathway thus can be worn without the regulator attached.






NFPA 1500

- 5-10.3 When operating in the hazardous area at an emergency scene without the full facepiece of respiratory protection being worn, members shall deploy the goggles for eye protection.






NFPA 1971

- *Standard on Protective Ensemble for Structural Fire Fighting,* 2000 edition (NFPA 1971-2000)
- This is the U.S. Fire Service's official guide to minimum standards for protective ensemble elements. According to NFPA 1971-2000, eye protection is a component of the helmet element, and either a goggle or a faceshield must be attached to each structural helmet at all times.
- 4-2.2 Protective Helmet Design Requirements. Helmets for structural fire fighting shall consist of at least the following assembled components:
- (6) Either a faceshield, or goggles, or both






NFPA 1971

- 1-3.37 Definition: Faceshield. The helmet component intended to help protect a portion of the wearer's face in addition to the eyes, not intended as primary eye protection.
- 1-3.50 Definition: Goggles. The helmet component intended to help protect the wearer's eyes and a portion of the wearer's face, not intended as primary eye protection.






NFPA

Fire department personnel involved in a hazardous materials incident should be protected against potential chemical hazards.

The purpose of chemical-protective clothing and equipment is to shield or isolate individuals from the chemical hazards that can be encountered during hazardous materials responses.

Adequate chemical protective clothing should be carefully selected and used to protect the respiratory system, skin, eyes, face, hands, feet, head, body, and hearing.






Review

- The eyes shall be protected appropriately for the hazard 100 percent of the time by one of the approved methods.
- The policy should depict three levels of primary eye protection: safety glasses, goggles, and SCBA face piece.
- The policy should require the use of an SCBA face piece for all structure fires, vehicle fires, and dumpster fires and anytime there is visible smoke or haze.
- Goggles should be required to be used with a shroud for wildland operations. In addition, goggles should be required during vehicle extrication, saw operations, helicopter landings, and any other time firefighters are exposed to flying debris.
- Although the safety glasses provide adequate protection, the goggles will not be dislodged from the face as easily






Review

- Safety glasses should be considered the minimum level of protection when any type of hazard potentially exists. They are required during all other incidents. Safety glasses, as the minimum requirements, allow all personnel to be protected to the ANSI Z87.1 level of protection during all incidents.
- Safety glasses should be part of the universal precautions for protection against bloodborne and airborne pathogens.
- Safety glasses are not necessarily suitable replacements for goggles. Each component provides a different level of protection appropriate for the level of potential dangers the eyes may face. It is very important to note that for this type of policy to be successful, the eye protection device must be accessible at all times, and personnel should be aware of what level of protection is appropriate for a given hazard.
- Bourke T-style eye shields are "cosmetic" in nature and are not to be used as eye protection. They are not NFPA 1971-compliant and are not considered primary eye protection.






EYE SAFETY QUIZ