Eye Safety
Emergency Response & Disaster Recovery

Contents

Minimum Necessary Eye Protection Guidelines
Eye Hazards for Emergency Response and Disaster Recovery
Four Points to Eye Safety
Types of Eye Protection
Eye Safety for Prescription Lens Wearers
First Aid for Eye Injuries
Information Resources

Summary

- **Use ANSI Z87.1 certified industrial eye protection with Z87 on the frames/lens.**
- **Wear safety glasses with side protection** *at the minimum!*
- **Most workers should wear goggles.**
- **Hybrid eye safety products with the comfort of glasses, the enclosure of goggles, and better breathability should be considered.**
- **Add a face shield over glasses or goggles for greater protection.**
- **The best general protection is a full-face respirator.**
- **Welders should use a welding helmet or goggles with the appropriate lens shade.**
- **Welder's helpers, other workers, and bystanders must have welding light protection when near torch cutting or welding.**

Back to table of contents

Eye Hazards for Emergency Response and Disaster Recovery

Common hazards

- Dust, concrete, and metal particles
- Falling or shifting debris, building materials, glass
- Smoke, noxious/poisonous gases
- Chemicals (acids, bases, fuels, solvents, lime, wet or dry cement powder)
- Welding light and electrical arc
- Thermal hazards and fires
- Bloodborne pathogens (hepatitis or HIV) from blood, body fluids, human remains

Common injuries

- Corneal abrasions and conjunctivitis (red eyes)
- Concrete or metal particles or slivers embedded in the eye
- Chemical splash or burn
- Welder's flashburn
- Eyeball laceration
- Facial contusion and black eye
- Bloodborne pathogen exposure from blood or other body fluids or human remains

Back to table of contents

4 Points to Eye Safety

1. Have a safe work environment

- Minimize hazards from falling or unstable debris.
- Make sure that tools work and safety features (machine guards) are in place.
- Ensure that workers, particularly volunteers, know how to use tools properly.
- Keep bystanders out of the hazard area.

2. Evaluate your safety hazards

- Know your primary hazards.
- Recognize hazards from nearby workers, large machinery, and falling/shifting debris.

3. Wear the proper eye and face protection

- Select the Z87 eye protection for the hazard.
- Make sure the eye protection is in good condition.
- Make sure it fits properly and will stay in place.

- Eye/face protection devices should not be relied upon to provide complete protection.

4. Prepare for eye injuries and first aid needs

- Have an eyewash or sterile solutions on hand.

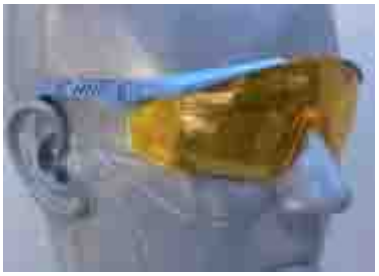
Back to table of contents

Types of Eye Protection

Use certified eye protection. Look for the "Z87" mark on the lens or frames.

Safety Glasses–*minimum required*

1. Use safety glasses for general working conditions where there may be *minor* dust, chips, or flying particles.
2. Use safety glasses with side protection such as side shields or wrap-around style.
3. Use safety glasses treated for anti-fog.
4. Use an eyewear retainer to keep the glasses tight to the face or hanging from the neck if not in use.



Non-prescription Safety Glasses with wrap-around side protection



Prescription Safety Glasses with side shields

Goggles–*better protection*

1. Use goggles for higher impact protection, greater dust, chemical splash, and welding light protection
2. Goggles for splash or fine dust protection should have indirect venting. Use direct vented goggles for less fogging when working with large particles.
3. Safety goggles designed after ski type goggles with high air flow

minimize fogging while providing better particle and splash protection.





Indirect-Vented Goggles

Hybrid safety glasses / goggles–*better protection*

1. Safety glasses with foam or rubber around lens provide better protection from dust and flying particles than conventional safety glasses with only side shields.
2. Wrap-around safety glasses that convert to goggles with a soft plastic/rubber face seal may offer better peripheral vision than conventional goggles.

For greater impact and face protection use a shield over safety glasses / goggles

---

Face Shields–*Additional protection*

1. Use face shields for highest impact, full face protection for spraying, chipping, grinding, and critical chemical or bloodborne hazards.
2. Face shields may be tinted or metal coated for heat and splatter protection.
3. The curve of the face shield will direct particles or chemicals coming from the side into the eyes. **Always wear safety glasses or goggles under a face shield.**



Clear face shields
with crown protector
(may be mounted on hard hat)

Welding

1. Exposure to welding light causes severe burns to the eye and surrounding tissue --"welder's flash."
2. Lens for welding light protection must be marked with the "Shade Number" (1.5-14, 14 = darkest).
3. Protect the eyes even when the helmet is lifted up.
4. Protect the welder, welder's helper, and bystanders.



Use the darkest shade possible

Torch soldering	**1.5-3**
Torch brazing/cutting	**3-6**
Gas welding	**4-8**
Electric arc welding	**10-14**

Use Z136 eye protection for laser light hazards (NOT Z87)

Note: The examples shown are for illustration purposes only and do not imply endorsement by the U.S. Government

Photos courtesy of Dr. Paul Vinger, Tufts Medical School

Respirators–Full face & half-mask

1. Full-face respirators provide the best general dust, chemical and smoke protection (respirators may not be Z87 compliant for impact protection).
2. When half-face respirators are used, respirator must not interfere with the proper positioning of the eye protection.

Eye Safety for Prescription Lens Wearers

Use polycarbonate or Trivex® lenses for the best impact protection in prescription safety glasses.

Prescription Safety Glasses

1. Workers who wear prescription glasses should wear tightfitting goggles over normal streetwear glasses or contact lenses.
2. Goggles should also be worn over prescription safety glasses in high dust environments.
   If worn alone, prescription safety glasses must have side shields.
3. Prescription safety lenses with tempered glass or acrylic plastic lenses are not suitable for high impact. These types of safety glasses should not be used when working in
   debris areas unless covered by goggles or face shield.
4. Polycarbonate or Trivex®lenses should be used when working in high impact areas.
   New safety glasses with polycarbonate lenses should be hard-coated to reduce scratching
   Contact lenses may present a significant corneal abrasion risk when working in dusty areas unless tightfitting goggles or a full-face respirator are worn.
5. Full-face respirators will not seal properly over streetwear glasses or safety glasses. Prescription inserts compatible with a respirator should be used. Respirators should be professionally fitted.

Use ANSI Z87.1 Certified Safety Eye Protection

Look for the Z87mark on the frame or lens

Caution – Brush, shake, or vacuum dust and debris from hardhats, hair, forehead, or the top of the eye protection before removing protection. Beware of rubbing eyes with dirty hands or clothing. Clean eyewear regularly.

First Aid for Eye Injuries

Specks in the Eye

- Do not rub the eye.
- Use an eye wash, flush eye copiously.
- See a doctor if speck does not wash out, pain or redness continues.

Cuts, Punctures, Objects Stuck in the Eye

- Do not wash out the eye.
- Do not try to remove an object stuck in the eye.
- Stabilize eye with a rigid shield without pressure such as with the bottom half of a paper cup.
- See a doctor at once.

Chemical Burns

- Immediately flush eye with water or any drinkable liquid. Open the eye as wide as possible. Continue flushing for at least 15 minutes. For caustic or basic solutions continue flushing while in route to doctor.
- If a contact lens is in the eye, begin flushing over the lens immediately. Flushing may dislodge the lens.
- See a doctor at once.

Blows to the Eye

- Apply cold compress without pressure.
- Crushed ice in a plastic bag can be taped to the forehead to rest gently on the
  injured eye.
- See a doctor at once in cases of continued pain, reduced vision, blood in eye
  or discoloration which can mean internal eye damage.

First aid advice reprinted with permission of Prevent Blindness America®

Back to table of contents

Information Resources

National Institute for Occupational Safety and Health
1-800-35-NIOSH **www.cdc.gov/niosh**

Occupational Safety and Health Administration
1-800-321-OSHA **www.osha.gov**

Prevent Blindness America
1-800-331-2020 **www.preventblindness.org**

International Safety Equipment Association

1-703-525-1695 www.safetyequipment.org

American Society of Safety Engineers
1-847-699-2929 www.asse.org