

Eye and face protection for welders

Welding operations expose workers to intense light, flying sparks, hot metal, and chemical fumes, all of which can cause serious eye and face injuries. Without proper protection, welders risk burns, cuts, and long-term vision damage.

Common hazards

Flying sparks and hot slag

Flying sparks and hot slag come from arc or gas welding. This hazard can cause burns to the skin and eyes and ignite flammable materials in the vicinity.

Infrared (IR) and ultraviolet (UV) radiation

Prolonged exposure to IR and UV radiation from the welding arc can lead to severe eye injuries, including cataracts and photokeratitis, also known as “arc eye” or “welder’s flash”.

Molten metal splatter

Molten splatter can cause serious burns and eye injuries, and may also ignite clothing and nearby combustible materials.

Grinding and chipping debris

Grinding particles and chipping debris can fly off at high speeds during prep or cleanup and cause eye injuries, cuts, and bruises.

Chemical exposure

Exposure from fluxes or coatings can happen by inhaling fumes, which can lead to respiratory issues. Skin contact with chemicals can cause burns or allergic reactions.

OSHA requirements for welders

Employers must ensure welders use eye and face protection that is:

- Appropriate for the type of welding being performed
- Rated to ANSI Z87.1 standards
- Equipped with side protection when there is risk of flying objects

Face shields must be used in addition to safety glasses or goggles — not as a replacement.

Eye and face protection for welders

Filter lenses must have a shade number appropriate to the welding task to protect against harmful light radiation (see table below). Always refer to the [full OSHA table](#) for specific operations.

Welding operations	Shade number
Shield metal-arc welding $\frac{1}{16}$, $\frac{3}{32}$, $\frac{1}{8}$, $\frac{5}{32}$ -inch diameter electrodes	10
Gas-shielded arc welding (nonferrous) $\frac{1}{16}$, $\frac{3}{32}$, $\frac{1}{8}$, $\frac{5}{32}$ -inch diameter electrodes	11
Gas-shielded arc welding (ferrous) $\frac{1}{16}$, $\frac{3}{32}$, $\frac{1}{8}$, $\frac{5}{32}$ -inch diameter electrodes	12
Shielded metal-arc welding $\frac{3}{16}$, $\frac{7}{32}$, $\frac{1}{4}$ -inch diameter electrodes	12
$\frac{5}{16}$, $\frac{3}{8}$ -inch diameter electrodes	14
Atomic hydrogen welding	10-14
Carbon-arc welding	14
Soldering	2
Torch brazing	3 or 4
Light cutting, up to 1 inch	3 or 4
Medium cutting, 1-6 inches	4 or 5
Heavy cutting, over 6 inches	5 or 6
Gas welding (light), up to $\frac{1}{8}$ -inch	4 or 5
Gas welding (medium), $\frac{1}{8}$ -inch to $\frac{1}{2}$ -inch	5 or 6
Gas welding (heavy), over $\frac{1}{2}$ -inch	6 or 8

Best practices for welders

- Inspect PPE daily for cracks, pitting, or loose parts
- Use goggles or safety glasses with side shields under welding helmets
- Keep lenses clean and scratch-free to maintain visibility and protection
- Use auto-darkening helmets that meet ANSI Z87.1 and adjust to the correct shade
- Store helmets and face shields in a clean, dry place to prevent damage
- Never weld without proper protection — even for a quick tack weld

Discussion questions

- What type of welding are you doing today, and what shade lens do you need?
- Have you ever experienced “arc eye” or a flash burn? What caused it?
- Do you know where to get replacement PPE if yours is damaged?

Key takeaways

Just one moment of welding without the right eye and face protection can lead to serious, lasting damage. Protect your eyes by wearing the correct PPE for every task and never compromise on safety.

OSHA Standard Reference: 29 CFR 1926.102 – Eye and Face Protection

Related Standard: ANSI Z87.1 Occupational and Educational Personal Eye and Face Protection Devices

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