



Choosing Helmets and Goggles

Arc-Zone.com® Technical-Focus Sheet

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Choosing Welding Helmets and Goggles

Few decisions affect the safety and well-being of welders as much as his or her choice of eye and face protection equipment. The CPSC (Consumer Product Safety Commission) estimates that approximately 10,000 eye injuries related to welding occurred each year, and making a wise choice of helmets or goggles can greatly reduce the chances of your becoming injured. Most importantly, always choose helmets and goggles complying with ANSI Z87.1. When choosing them, there are three main considerations:

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- Fixed filtration versus variable electronic darkening
- Traditional flip up helmets versus autodarkening ones
- The filter shade rating number required by the job

The filter lens should be marked with the manufacturer, the shade number or number range, and Z87.1. For cutting or working overhead, use a full-face shield on top of safety glasses. If using goggles, to prevent fogging, ensure that the vents aren't obstructed.

Fixed Versus Variable Filtration

This choice usually comes down to cost and reliability. Fixed shade helmets and goggles are less expensive, easier to maintain, and more reliable. Variable shade helmets are electronic devices that provide much greater flexibility if welding conditions vary. The shade rating determines the welder's ability to see what he or she is doing when welding. Welding shades range from nine to 14 with higher numbers being darker. If the



shade is too light, the arc will obscure details of the welding puddle. If the shade is too dark, only the arc will be visible. Contrary to popular opinion, the shade rating has nothing to do with the shade's ability to protect the user from light radiation. All welding shades provide 100% protection.

Autodarkening Versus Traditional Flip-up Helmets

Many modern helmets automatically darken when the welder strikes an arc. Traditional flip-up helmets are less expensive, easier to maintain, and more reliable; however, autodarkening has many important safety and quality advantages. Autodarkening filters have the following traits:

- They give continuous visibility before, during, and after striking an arc. This discourages raising and snapping the helmet and improves weld starting accuracy.
- Keeping the helmet down lessens the chance of injury from nearby workers' activities.
- Even when the electronics fail, they provide protection like a fixed filter.
- Their darkening can be delayed by blocked light sensors, poor configuration, low temperatures, or weak batteries.

Fixed shade filters have the following traits:

- They only provide protection when they are worn and in the down position. Welders raise the shield when starting a new weld or inspecting a completed one. This greatly increases the likelihood of unintentional radiation exposure.
- Raising and lowering fixed shields by head snapping can result in neck or muscle strain.
- The inability to precisely position the arc before starting encourages shield snapping and misplaced starts.

Choosing Filter Shades

Choosing the proper shade number for welding and flame cutting is very important. Factors to consider include:

- Type of lens filter—reflective or standard
- Radiant energy intensity produced by cutting or welding
- Background lighting intensity

The following table lists the recommended minimum lens number for welding activities. If two numbers appear, the first is for standard and the second is for reflective. Welders may always vary their choice to suit their needs. The bottom line is whether the welder can properly see the details of the work.

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Type of work	Indoors	Outdoors
Air/carbon arc cutting	12, 11	11, 10
Flame cutting	4	3
Flux core welding	12, 11	11, 10
Gas metal arc welding	11, 10	10, 9
Gas tungsten arc welding	11, 10	10, 9
Gas welding	5	4
Plasma arc cutting	11, 10	10, 9
Plasma arc welding	11, 10	10, 9
Shielded metal arc welding	11, 10	10, 9
Torch brazing	9	2
Torch soldering	2	2

Cheater Lenses

Cheater or mag lenses are essentially reading glasses for your welding helmet. Because age-induced farsightedness (presbyopia) is a normal development, nearly all welders will eventually need some sort of help seeing when welding. You have two choices—wear corrective lenses under your helmet or buy lenses designed to clip to it.

When choosing the strength of your cheater lens, consider the following: The correction you need is directly related to how old you are. If you are under 40 years

old, you probably need around a +1.25 diopter lens strength. At 40–45 years old, you need around +1.75. At 45–50, you need around +2.00. Above 50 years old you need around +2.25. Even knowing this, there's no substitute for simply trying different lenses. Hold the lens up to your face at the distance it would be in a helmet. Look at detailed items at the distance you normally weld at. Alternatively, most reading glasses displays at stores have a reading chart for choosing a lens; however, it's common for welders to use a slightly different diopter for welding than they do for regular reading.

Choose the lowest diopter where you can clearly see. Use the minimum diopter that does the job because the higher the diopter the greater the size distortion of the perceived item, and the shallower your depth of field. Depth of field is the distance range that items can be away from your eyes and still be in focus. A shallow depth of field means that you have to move your head more often to ensure that what you're looking at remains in focus.

About Arc-Zone.com

Jim Watson

Jim is CEO and founder of Arc-Zone.com. He is a master fabricator with years of hands-on experience in his own shop and also as a winning motorcycle racer, car builder, and chief mechanic for a top motorsports team. He also has extensive experience in manufacturing, technical sales, and product development. Before launching Arc-Zone.com, he held leadership positions in some of the most respected companies in the welding industry.

Arc-Zone.com

Under Jim's direction, Arc-Zone.com has led the industry in product innovation and online sales and service, becoming the world's leading supplier of high-quality, high-performance welding and metal working tools and accessories.

Contact Us

Contact us by phone, email, fax, or even-old-fashioned regular mail:

Arc-Zone.com, Inc.
2091 Las Palmas Drive Suite F
Carlsbad, CA 92011
800.944.2243 (Toll Free US)
1.760.931.1500 (Worldwide)
info@arc-zone.com

