9 Steps to Comply with Welding PPE Requirements

The OSHA Welding, Cutting and Brazing Standard (Sec. 1910.252) requires you to take specific safety measures to protect workers who engage in welding and other “hot work” operations. Here are the 9 steps to take to comply with the personal protective equipment (PPE) requirements of the standard.

Step 1: Select PPE that’s Proper for the Job Involved

The PPE required varies depending on the type of operation performed:

<table>
<thead>
<tr>
<th>Type of Operation</th>
<th>PPE Required</th>
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</thead>
</table>
| Arc welding & arc cutting (other than submerged arc welding) (1) | • Helmets or hand shields  
• Attendants/Helpers must use “proper eye protection” |
| Gas welding & oxygen cutting (2)                       | • Goggles or other suitable eye protection  
• OK to use spectacles without side shields that have suitable filter lenses for gas welding operations on light work, torch brazing or inspection |
| Resistance welding or brazing (3)                     | • All operators and attendants must use transparent face shields or goggles adequate to protect their eyes and face for the particular job |
| Other brazing operations                               | • Suitable goggles                                                            |

Notes:
(1) Operations in which electric arc provides the source of heat to weld and cut metal  
(2) Operations that use fuel gases and oxygen to weld and cut metal  
(3) Operations that join parts using heat generated by passing an electric current at the place the parts meet for a controlled amount of time and using a controlled amount of pressure

Step 2: Make Sure Helmets Meet Equipment Specifications

The next phase of compliance is to ensure that each form of PPE you select meets the criteria set out in the OSHA standard for that particular equipment. Let’s start with helmets. According to the standard, helmets must:

- Be made of a material that insulates heat or electricity;
- Not be readily flammable;
- Be capable of withstanding sterilization;
- Be arranged to protect the face, neck and ears from the arc’s direct radiant energy;
- Have filter plates and cover plates designed for easy removal; and
Have parts constructed of a material that won’t readily corrode or discolor the skin.

Step 3: Make Sure Hand Shields Meet Equipment Specifications

Hand shields are subject to pretty much the same equipment requirements as helmets. They must:

- Be made of a material that insulates heat or electricity;
- Not be readily flammable;
- Be capable of withstanding sterilization;
- Be arranged to protect the face, neck and ears from the arc’s direct radiant energy; and
- Have parts constructed of a material that won’t readily corrode or discolor the skin.

Step 4: Make Sure Goggles Meet Equipment Specifications

Like hand shields, goggles must:

- Not be readily flammable;
- Be capable of withstanding sterilization; and
- Have parts constructed of a material that won’t readily corrode or discolor the skin.

Goggles must also be ventilated to prevent fogging of the lenses “as much as practicable.”

Step 5: Make Sure Goggle Lenses Meet Equipment Specifications

There are also specific requirements that apply to the lenses of goggles:

- Glass for lenses must be tempered;
- Glass for lenses must also be “substantially free” from striae (i.e., grooves), air bubbles, waves and other flaws;
- The front and rear surfaces of lenses and windows must be smooth and parallel (except for prescription lenses); and
- Lenses must have some permanent distinctive marking indicating their source and shade.

Step 6: Make Sure Lenses Provide Appropriate Shade

Lenses provide different levels of shade which are marked by a numerical scale. The standard has a table listing recommending shade levels appropriate for different operations. The table isn’t mandatory and you can deviate from it to suit the particular needs of each individual worker:
<table>
<thead>
<tr>
<th>Welding Operation</th>
<th>Shade Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shielded metal arc welding—1/16-, 3/32-, 1/8-, 5/32-inch electrodes</td>
<td>10</td>
</tr>
<tr>
<td>Gas-shielded arc welding (nonferrous)—1/16-, 3/32-, 1/8-, 5/32-inch electrodes</td>
<td>11</td>
</tr>
<tr>
<td>Gas-shielded arc welding (ferrous)—1/16-, 3/32-, 1/8-, 5/32-inch electrodes</td>
<td>12</td>
</tr>
<tr>
<td>Shielded metal arc welding—3/16-, 7/32-, 1/4-inch electrodes</td>
<td>12</td>
</tr>
<tr>
<td>Shielded metal arc welding—5/16-, 3/8-inch electrodes</td>
<td>14</td>
</tr>
<tr>
<td>Atomic hydrogen welding</td>
<td>10-14</td>
</tr>
<tr>
<td>Carbon arc welding</td>
<td>10-14</td>
</tr>
<tr>
<td>Soldering</td>
<td>2</td>
</tr>
<tr>
<td>Torch brazing</td>
<td>3 or 4</td>
</tr>
<tr>
<td>Light cutting, up to 1 inch</td>
<td>3 or 4</td>
</tr>
<tr>
<td>Medium cutting, 1 inch to 6 inches</td>
<td>4 or 5</td>
</tr>
<tr>
<td>Heavy cutting, 6 inches and over</td>
<td>5 or 6</td>
</tr>
<tr>
<td>Gas welding (light) up to 1/8 inch</td>
<td>4 or 5</td>
</tr>
<tr>
<td>Gas welding (medium) 1/8 inch to 1/2 inch</td>
<td>5 or 6</td>
</tr>
<tr>
<td>Gas welding (heavy) 1/2 inch and over</td>
<td>6 or 8</td>
</tr>
</tbody>
</table>

**Note:**

OSHA says it’s “desirable” to use a filter or lens that absorbs the yellow or sodium line in the visible light of the operation in gas welding or oxygen cutting where the torch produces a high yellow light.

**Step 7: Make Sure Filter Lenses Meet ANSI Standards**

Filter lenses must also meet the test for transmission of radiant energy listed in any of the voluntary standards listed in the OSHA Eye and Face Protection Standard (Sec. 1910.133(b)(1)):


**Step 8: Use Booths & Screens to Protect Welders from Arc Welding Rays**

Where work permits, welders should be enclosed in an individual booth painted with a finish of low reflectivity such as zinc oxide (which helps absorb ultraviolet radiations) and lamp black, or enclosed with noncombustible screens painted the same way. Booths and screens must allow permit circulation of air at floor level. Workers or other persons near the welding areas must be protected from the rays by noncombustible or flameproof screens or shields or required to wear appropriate goggles.
Step 9: Make Sure Workers Have Protective Clothing

Workers exposed to hazards from welding, cutting or brazing operations also need to use any other PPE required under the PPE standard, which may include flame-proof and other protective clothing.

For More Help Complying with OSHA Welding Requirements

- How GHS Affects Welding Operations
- Spot the OSHA Violation: Is This the Right Way to Use a Welding Torch?
- Ask the Expert: Flame-Resistant Clothing & Heat Stress
- Spot the OSHA Violation: Is This What Your Workers to Wear for Hot Work?