

Lesson 1.3: Fact Sheet - Welding Safety – Personal Protective Equipment

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

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PPE Protects:

- Eyes and Face
- Head
- Hearing
- Feet
- Hands
- Body

Eye and Face Hazards:

- Flying particles: dust, dirt, metal or wood chips from chipping, grinding, sawing, hammering
- Chemical splashes: corrosive substances, hot liquids, solvents or other hazardous solutions
- Objects swinging into eye or face: chains, tools or ropes
- Light radiation: welding, lasers, other radiant light, heat, glare, sparks, splash and flying particles

Types of Eye and Face PPE must comply with ANSI Z87.1:

- Safety glasses with side shields
- Goggles
- Face shields
- Welding hoods
- Cutting goggles

Safety Glasses and Goggles

- Must be worn in the welding lab at all times
- If you wear glasses, you must wear goggles over them, or buy special glasses that meet ANSI Z87.1 standards

**Face Shields**

- Extra protection for eyes
- Safety glasses need to be worn under face shields
- Protects the face from grinding sparks, dust, and chemical hazards (NOT impact)

**Welding Helmets and Cutting Goggles**

- Must use the proper filter lens
- Arc welding: 10-11
- Oxy fuel cutting: 5
- Plasma cutting: 5-9

**Skull Cap or Welding Hat**

- Welders are exposed to flying sparks that can burn your hair and skull
- Skull caps and welding hats will protect your head from sparks

**Earplugs and Earmuffs**

- Grinding, machining, and some welding operations can create enough noise to damage hearing

**Foot Hazards**

- Falling or rolling objects
- Sharp objects/objects piercing the sole
- Exposure to electrical hazards
- Molten metal or sparks splashing on feet
- Hot surfaces
- Slippery or wet surfaces

Shoe Precautions

- NEVER wear open toe shoes while welding because molten metal sparks and arc rays can burn exposed skin
- Tennis shoes are NOT recommended while welding because molten metal can easily burn through the top of the shoe and burn the foot

Safety Shoes for Welding

- Steel toe safety shoes
- Steel toe safety shoes with metatarsal guards
- Safety shoes that are nonconductive with heat resistant soles

**Hand Hazards**

- Cuts or lacerations
- Abrasions
- Punctures
- Thermal burns
- Harmful temperature extremes
- Potentially injurious light radiation (arc rays)

Welding Gloves

- Leather gauntlet style, flame retardant welding gloves are ideal for welding.
- Be sure to keep welding gloves dry; wet gloves can cause electrical shock or steam burn while welding.

**Body Hazards**

- Temperature extremes
- Potentially injurious light radiation (arc rays)
- Hot splashes from molten metals
- Impacts from tools, machinery and materials
- Hazardous chemicals
- Contact with potentially infectious materials, like blood

Types of PPE for the Body

- Clothing made of wool
- Clothing made of 100% cotton
- Clothing that has a tag identifying it as flame retardant
- Leather welding jackets
- Flame retardant welding jackets
- Leather welding aprons
- Welding sleeves
- Heavy 100% cotton denim jeans
- Leather chaps
- 100% cotton socks
- Flame retardant 100% cotton bibs or overalls

Clothing Precautions

- No cuffs in clothing
 - Molten metal will fall into cuffs and catch fire
 - Pant legs need to extend over the top of safety shoes
- Never weld in clothes with holes or frayed material
 - Frayed material catches fire quickly
- No pockets in the front of shirts
 - Molten metal will fall into front pockets and catch fire
- Always check the tags of your clothes:
- No clothing made of synthetic (man-made) fibers, or synthetic blends
 - Synthetic material is any material other than wool or cotton
 - Synthetic material will melt when making contact with molten metal, and can melt to the skin, causing serious burns
- Clothing should be free from grease, oil, or other combustible chemicals or materials
- Reduce exposure to oxygen
 - Exposure to oxygen can saturate clothing with oxygen, making the clothing combustible

Skin Precautions

- Make sure all skin is covered by flame- retardant treated material, leather, wool or 100% cotton
- Any exposed skin will be burned by arc rays