

9 - Welding: Safety Training

EH&S – MGA

Goals: This safety session should teach you to:

- A. Know the hazards of welding and other forms of hot work.
- B. Understand the safety precautions to take to reduce those hazards and keep themselves safe while doing this dangerous work.

OSHA Regulations: CFR 1910, Subpart Q, and CFR 1926, Subpart J

1. Hot work includes more than 80 different types of welding and associated processes.

- A. Welding joins pieces of metal by the use of heat, pressure, or both; the two main types being gas welding and arc welding.
- B. Brazing or soldering involves a filler metal or alloy that has a lower melting point than the metal pieces to be joined.
- C. Metal cutting involves heating the metal with a flame and directing a stream of pure oxygen along the cutting line.
- D. Some other types of hot work use electron beams, ultrasonic sound, lasers, and chemical reactions.

2. There are many health hazards associated with welding fumes and gases, both acute and long term, and reproductive risks as well.

- A. These fumes, also called welding “smoke,” come from a variety of sources: the base or filler material, shielding gases, coatings, paints, cleaners, degreasers, etc., and can be extremely toxic.
- B. Welding smoke can cause damage to eyes, nose, chest, respiratory tract, and gastrointestinal system.
- C. Many common substances in welding fumes such as cadmium, nickel, beryllium, chromium, and arsenic are known carcinogens (cancer-causing agents).

3. There are several other types of health hazards as well.

- A. The intense heat of welding can cause burns, and contact with hot slag, metal chips, sparks, and hot electrodes can cause eye injuries.
- B. Invisible ultraviolet light (UV), infrared radiation, as well as the intense visible light from welding can all cause permanent eye damage.
- C. Many welders also suffer musculoskeletal injuries of all types caused by awkward work postures, vibration, and heavy lifting.
- D. In addition, welding is often performed in a noisy work environment requiring proper ear protection to prevent hearing loss.

4. Fire and explosion are big hazards because of high welding temperatures and the fact that welding sparks can travel up to 35 feet.

- A. Welding should be performed in a separate area with fire-resistant floors and away from any combustible materials.
- B. Suitable fire extinguishing equipment shall be maintained in a state of readiness for instant use.
- C. Fire watchers are required whenever welding or cutting is performed in a location where other than a minor fire might develop.
- D. All welders need thorough training in order to perform work safely.
- E. Make sure the welding area has adequate ventilation.

5. Gas welders must know what is in a cylinder, since precautions will vary.

- A. Keep cylinders upright and properly secured.
- B. Gas cylinders should be stored in dry, ventilated areas on a fireproof floor, away from flammable materials or heat sources.
- C. Check equipment and hoses regularly for leaks.

6. Arc welders must be careful to follow all electrical safety rules.

- A. Ground whatever you are welding or cutting with a separate electrical connection.
- B. Be sure your electric system is adequate for the load of your welder.
- C. Work in a dry area to avoid possible electric shock.

7. Welders must wear proper protective clothing at all times.

- A. Gas welders should wear impact- and heat-resistant goggles or eye protection and, in many cases, flame-resistant helmets.
- B. Arc welders should wear helmets and eye protection that resist heat, fire, impact, and electricity.
- C. All welders should wear flame-retardant clothing, high-top boots, and gauntlet type gloves.
- D. In some cases a respirator must be used to protect the welder from toxic fumes.
- E. Workers should check the SDSs for any hazardous chemicals in use so that they can protect themselves properly.

Summation:

Pay attention to safe practices while welding.