



## GOALS

This safety session teaches employees to:

- Identify arc welding hazards.
- Take proper precautions to prevent fires and injuries.

### Applicable Regulations: 29 CFR 1910.254



#### 1. Understand the hazards of arc welding operations.

- Fire is one of the greatest hazards of arc welding operations.
  - Arc welding equipment produces high temperatures, which can ignite nearby materials; *and*
  - Sparks from welding can also cause fires.
- There is also the risk of electrical shock, sometimes strong enough to kill a welder.
- Welder's flash is another hazard of working with or around arc welding equipment.
  - The intense light of the arc can burn the cornea of the unprotected eye; *and*
  - Welder's flash usually does not result in permanent damage to the eye.
- Long-term unprotected exposure to the ultraviolet (UV) light of the arc can cause permanent eye damage, including damage to the retina.
- Hazardous fumes from welding operations are another health hazard.

#### 2. Make certain that the work area is properly ventilated.

- Adequate ventilation is required during arc welding operations to control levels of airborne contaminants produced by operations, which could be hazardous to your health.
- When materials may produce hazardous or toxic vapors, local exhaust ventilation should be used to remove contaminants as close to the source of the welding operation as possible.
- When toxic metal fumes may be produced, appropriate respiratory protection must be worn.
  - For example, when welding metals with hazardous coatings.

#### 3. Use personal protective equipment (PPE) to protect against arc welding hazards.

- PPE protects against heat, sparks, and UV rays produced by arc welding operations.
- Fire-retardant protective clothing (coveralls) should be worn to protect the body.
- Leather gauntlet gloves should be used to protect hands.
- Safety shoes with high tops should be worn to protect feet and ankles from heat and sparks.
- Wear a welding helmet with a filter plate to protect eyes from the intense light of the arc.
  - Check with your supervisor before beginning operations if you are uncertain about what shade of filter lens is required for the work you are performing.
- A flameproof skull cap will protect the head and hair.
- Hearing protection should be worn when working in noisy areas.
- Inspect all PPE before use to ensure it is in good condition and safe to use.



# Safety Trainer **Arc Welding Safety**

- Besides welders, other workers may also need PPE to protect against rays from the arc.
  - Anyone within 20 feet of operations should wear clear polycarbonate safety glasses with side shields or be shielded from the operation by an opaque barrier to prevent welder's flash.

#### 4. Take all necessary precautions to prevent fires.

- Remove combustible and flammable materials to a safe distance from the area of operations.
- Set up fire barriers around arc welding operations.
- Make sure suitable fire extinguishing equipment, such as an ABC extinguisher or buckets of sand, is readily available to put out any fires that occur.
- Use a firewatcher to check for fires you do not detect when there is an elevated risk of fire.

#### 5. Operate arc welding equipment safely.

- Always follow manufacturers' instructions for safe operation of the equipment.
- Before welding, inspect equipment, checking to ensure all connections are properly made.
- Make sure the work lead is firmly attached to the work, freeing magnetic work clamps from any particles of metal spatter on contact surfaces.
- Spread out the coiled cable before use to avoid serious overheating and damage to insulation.
  - Never coil or loop the cable around parts of your body;
  - Cables with damaged insulation or exposed bare conductors must be replaced; *and*
  - Do not use cables with splices within 10 feet of the holder.
- Check that the equipment is properly grounded, and also ensure there are no leaks of cooling water, shielding gas, or engine fuel.
- Make sure electrodes are removed from holders when not in use for any substantial period of time and placed so that they cannot make electrical contact with people, conducting objects, fuel, or compressed gas tanks.
- Thoroughly dry and test any equipment that has become wet before using it again.
- Do not use defective equipment; report defects or other safety hazards to your supervisor.
  - Remember that arc welding equipment repairs should be made by qualified personnel only.



#### DISCUSSION POINTS:

Demonstrate proper arc welding procedures, including PPE, ventilation, and fire protection.



#### CONCLUSION:

- Take precautions against arc welding hazards.
- Arc welding operations can be hazardous to your health and safety if you fail to take the right precautions. Always follow required safety procedures to prevent accidents and fires.



#### TEST YOUR KNOWLEDGE:

Have your employees take the Arc Welding Safety quiz. By testing their knowledge, you can judge their ability to safely perform arc welding duties and whether they need to review this important topic again soon.



## ARC WELDING SAFETY QUIZ

1. **Intense light from the arc is the only hazard of arc welding.**  
a. True      b. False
2. **Welder's flash usually results in:**  
a. Permanent damage to the retina of the eye  
b. Temporary burn to the cornea of the eye  
c. Total blindness
3. **Fire is a serious hazard of arc welding operations.**  
a. True      b. False
4. **Ventilation during arc welding operations is not required.**  
a. True      b. False
5. **Personal protective equipment (PPE) for welders should include:**  
a. Protective clothing, gloves, and shoes  
b. Eye and head protection  
c. Both a and b
6. **Only welders need to wear eye protection, not other workers in the area of operations.**  
a. True      b. False
7. **Flammable and combustible materials should be removed from the area of welding operations.**  
a. True      b. False
8. **Fire extinguishing equipment is not required for arc welding operations.**  
a. True      b. False
9. **Electrodes should be removed from holders when not in use for any substantial period of time.**  
a. True      b. False
10. **What should you do about defective equipment?**  
a. Use it if it still works.  
b. Don't use it and report it.  
c. Try to fix it yourself.

**When you have completed this quiz, turn it in to your supervisor.**

**Name:** \_\_\_\_\_ **Date:** \_\_\_\_\_



## ANSWERS TO ARC WELDING SAFETY QUIZ

1. b. False. There are other hazards, such as fire, electric shock, and toxic fumes.
2. b. Welder's flash usually results in a temporary burn to the cornea, which heals in a relatively short time. However, long-term exposure to UV light can cause retinal damage that could be permanent.
3. a. True. Fire is a major hazard. Steps must always be taken to minimize the risk of fire.
4. b. False. Ventilation is required. When materials may produce hazardous vapors local exhaust ventilation is required. Respiratory protection is required when fumes could be toxic.
5. c. All of this PPE is required. Hearing and respiratory protection may also be required.
6. b. False. Anyone within 20 feet of operations should wear clear polycarbonate safety glasses with side shields or be shielded from the operation by an opaque barrier to prevent welder's flash.
7. a. True. They should be removed to a safe distance where they can't be ignited by heat or sparks from welding.
8. b. False. Always have fire extinguishing equipment and/or buckets of sand on hand. Also have a firewatcher when there is an elevated risk of fire.
9. a. True. They should be removed and placed so that they cannot make electrical contact with people, conducting objects, fuel, or compressed gas tanks.
10. b. Don't use defective equipment. Report it to your supervisor right away.