

Module Title: Arc Welding Safety

Objective: To be able to weld using safe practices and to know what personal protective equipment should be used.

Trainer's Note: It is important to weld using safety precautions. There are many dangers related to welding. During the training session have personal protective equipment available to show and for employees to try on.

Background

Arc welding includes shielded metal-arc, gas shielded and resistance welding. Since arc welding equipment varies in size and type, it is important to read and follow the manufacturer's recommendations.

General Arc Welding Safety:

- Before starting any arc welding operation, a complete inspection of the welder should be made.
- Read all warning labels and instructions manuals.
- Remove all potential fire hazards from the welding area.
- Always have a fire extinguisher ready for immediate use.
- Equip welding machines with power disconnect switches which can be shut off quickly.
- The power to the machine should be disconnected before making repairs.
- Proper grounding of welding machines is essential.
- Electrode holders should not be used if they have loose cable connections, defective jaws, or poor insulation.
- An arc should not be struck if someone without proper eye protection is nearby.

Personal Protective Equipment:

- Infrared radiation is a cause of retinal burning and cataracts. Protect your eyes and face with a welding helmet properly fitted and with the proper grade of filter plate.
- Protect your body from welding spatter and arc flash with protective clothing. Such as:
 - Woolen clothing
 - Flame-proof apron
 - Gloves
 - Properly fitted clothing that is not frayed or worn.
 - Shirts should have long sleeves.
 - Trousers should be straight-legged and covering shoes when arc welding.
 - Fire resistant cape or shoulder covers are needed for overhead work.
- Check protective clothing equipment before each use to make sure it is in good condition.
- Keep clothes free of grease and oil.

Proper Ventilation

Be sure there is adequate ventilation available when welding in confined areas or where there are barriers to air movement. Natural drafts, fans and positioning of the head can help keep fumes away from the welder's face.

Ventilation is sufficient if:

- The room or welding area contains at least 10,000 cubic feet for each welder.
- The ceiling height is not less than 16 feet.
- Cross ventilation is not blocked by partitions, equipment, or other structural barriers.
- Welding is not done in a confined space.

**If these space requirements are not met then the area needs to be equipped with mechanical ventilating equipment that exhausts at least 2000 cfm of air for each welder, except where local exhaust hoods or booths, or air-line respirators are used.

Avoiding Electrical Shock

Electrical shock can kill. To prevent electrical shock:

- Use well insulated electrode holders and cables.
- Make sure welding cables are dry and free of grease and oil.
- Keep welding cables away from power supply cables.
- Wear dry hole-free gloves.
- Clothing should also be dry.
- Insulate the welder from the ground by using dry insulation, such as a rubber mat or dry wood.
- Ground frames of welding units.
- Never change electrodes with bare hands or wet gloves.

Review The Following Points

- Proper personal protective equipment is important.
- Electrical shock can be deadly.
- If ventilation is not sufficient, then the welding area should be equipped with mechanical ventilating equipment.
- Always have a fire extinguisher ready for immediate use.

True or False Answer Key

1. T, 2. T, 3. F, 4. F, 5. T

True or False

Name _____

- | | | |
|--|---|---|
| 1. All potential fire hazards should be removed from the welding area. | T | F |
| 2. Use natural drafts or fans to keep the fumes away from your face. | T | F |
| 3. Eye protection is not always needed. | T | F |
| 4. It is acceptable to use electrode holders with loose cable connections. | T | F |
| 5. Electrodes should not be changed with bare hands or wet gloves. | T | F |