

## Module Title: Gas 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

Most farms and small shops have some type of equipment for welding and cutting metals. Acetylene is the most commonly used fuel gas. Acetylene is very flammable and hazardous and can ignite at a wide range of concentrations. Oxygen won't burn or explode, but it helps other objects burn at greater rates. Gases are stored in cylinders which can rupture. A cylinder containing compressed gas can shoot through the air like a rocket if its valve is damaged or broken.

### Storage and Handling

- Keep cylinders away from physical damage, heat, and tampering.
- Securely chain equipment to prevent falling.
- Store away from flammable and combustible materials.
- Store extra gas and oxygen cylinders separately.
- Store in an upright position.
- Close cylinder valves before moving.
- Protective caps or regulators should be kept in place.
- Roll cylinders on bottom edges to move--**Do not drag**.
- Allow very little movement when transporting.

### General Gas Welding Safety Tips

- Inspect equipment for leaks at all connections using approved leak-test solution.
- Inspect hoses for leaks and worn places.
- Replace bad hoses.
- Protect hoses and cylinders from sparks, flames and hot metal.
- Use a flint lighter to ignite the flame.
- Stand to the side (away from the regulators) when opening cylinder valves.
- Open cylinder valves very slowly to keep sudden high pressures from exploding the regulators.
- Only open the acetylene cylinder valve 1/4 - 3/4 turn; leave wrench in place so the cylinder can be quickly closed in an emergency.
- Open and light acetylene first, then open and adjust oxygen to a neutral flame.
- Close the acetylene torch valve first when shutting off the torch ( a "pop" might occur as the oxygen "blows out" the flame, but this eliminates the possibility of the flame burning up the acetylene line).
- When finished, close cylinder valves, bleed the lines to take pressure off regulators, neatly coil hoses and replace equipment.
- Have a fire extinguisher easily accessible at the welding site.

## **Personal Protective Equipment:**

- Infrared radiation is a cause of retinal burning and cataracts. Protect your eyes with safety glasses.
- 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.

## **Review The Following Points**

- Proper personal protective equipment is important.
- Acetylene is very flammable.
- Inspect all equipment before welding.
- 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. The acetylene torch valve should be closed first when shutting off the torch. T F
2. When moving cylinders they should be rolled on their bottom edges. T F
3. Oxygen is very flammable and will explode. T F
4. Extra gas and oxygen cylinders may be stored together. T F
5. Personal protective equipment needs to be worn when welding. T F