



Tailgate Safety Training for Landscaping and Horticultural Services

Agricultural Safety Program, 590 Woody Hayes Drive, Columbus, OH 43210

Gas Welding

Objective: Weld using safe practices and personal protection equipment (PPE).

How to Use This Module

Gas welding is an important but dangerous task. For this module:

- Read the information below on hazards and safe practices in gas welding.
- Ask your supervisor to demonstrate safe storage and handling practices.
- Practice safe storage and handling while your supervisor observes.
- Ask your supervisor to observe while you try on personal protection equipment.
- Review the important points.
- Take the True/False quiz to check your learning.

Background

Many operations have some type of equipment to weld and cut metals. Acetylene is the most commonly used fuel gas. Oxygen helps other objects burn and creates fire hazards. Acetylene and oxygen both present hazards, however.

- Acetylene is very flammable and can ignite in different concentrations.
- Oxygen cylinders contain enriched oxygen compared to the air; they can turn a spark into a life-threatening hazard.
- Cylinders can also rupture.
- A cylinder can shoot through the air like a rocket if its valve is damaged or broken.

Storage and Handling

- When not in use, keep gas and oxygen cylinders at least 20 feet apart. Or, separate them with a proper firewall.
- Store cylinders away from other flammable and combustible materials.
- Store extra gas and oxygen cylinders separately — at least 20 feet apart or separated by a proper firewall.
- Keep cylinders away from physical damage, heat, and tampering.
- Store cylinders in an upright position. Chain them securely to keep them from falling over. Chain the welding rig securely to prevent it from falling as well.
- Close cylinder valves before moving.

- Protective caps or regulators should be kept in place.
- Roll cylinders on bottom edges to move. Do not drag.
- Minimize cylinder movement when transporting.

General Gas Welding Safety Tips

- Lift gas cylinders only with equipment designed for that use.
- Inspect torches and clean only with the proper tools.
- Use only torches that have blow-back protection.
- Inspect equipment for leaks at all connections using an approved leak-test solution.
- Inspect hoses for leaks and worn places.
- Replace bad hoses.
- Have a fire extinguisher easily accessible at the welding site.
- 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.
- Use two-stage regulators whenever possible.
- When using a single-stage regulator, open cylinder valves very slowly. This keeps sudden high pressures from exploding the regulators.
- When using a single-stage regulator, only open the acetylene cylinder valve 1/4 to 3/4 turn.
- Leave the wrench in place. That way, you can close the cylinder quickly in an emergency.
- Open and light acetylene first. Then open and adjust oxygen to a neutral flame.
- When shutting off the torch, close the acetylene torch valve first. You might hear a pop as the oxygen blows out the flame, but the flame will not burn up the acetylene line.
- When finished:
 - ◆ Close cylinder valves.
 - ◆ Bleed the lines to take pressure off regulators.
 - ◆ Neatly coil hoses.
 - ◆ Replace equipment.

Personal Protection Equipment (PPE)

- Infrared radiation can cause retinal burning and cataracts. Protect your eyes with safety glasses.
- Protect your body from welding spatter and arc flash with protective clothing:
 - ◆ Woolen clothing (possibly cotton) — never synthetic!
 - ◆ Welding jackets
 - ◆ Flame-proof apron
 - ◆ Gloves
 - ◆ Properly fitted clothing that is not frayed or worn
 - ◆ Long-sleeve shirts
 - ◆ Straight-leg trousers that cover shoes
 - ◆ Fire resistant cape or shoulder covers for overhead work
 - ◆ Leathers to protect specific body parts or areas
- Check protective clothing equipment before each use. 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, mechanical ventilating equipment must be used. Equipment must exhaust at least 2,000 cubic feet of air per minute for each welder, except where local exhaust hoods or booths or air-line respirators are used.

Review These Important Points

- Proper personal protection 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.

About These Modules

The author team for the training modules in the landscape and horticultural tailgate training series includes Dee Jepsen, Program Director, Agricultural Safety and Health, Ohio State University Extension; Michael Wonacott, Research Specialist, Vocational Education; Peter Ling, Greenhouse Specialist; and Thomas Bean, Agricultural Safety Specialist. Modules were developed with funding from the Occupational Safety and Health Administration, U.S. Department of Labor, Grant Number 46E3-HT09.

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Answer Key: 1 = T, 2 = T, 3 = F, 4 = F, 5 = T.

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Name _____

True or False?

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 in the air is more flammable than oxygen in a cylinder. T F
4. Extra gas and oxygen cylinders may be stored together. T F
5. Personal protection equipment needs to be worn when welding. T F