

Compressed Gas Cylinders

1. Purpose

Safe use and storage of compressed gas cylinders requires caution. Exposing compressed gas cylinders and their contents to excessive heat, sources of ignition, or damage raises the danger of a fire or violent explosion.

This policy outlines the requirements necessary to ensure the safe use, handling, and storage of compressed gas cylinders. Compliance with the requirements and procedures of this policy will help prevent accidents and injuries that may result from misuse, mishandling, or improper storage of the cylinders.

2. Scope

This policy applies to all personnel who work with or around compressed gas cylinders. It includes requirements and procedures for the safe handling of all oxygen, nitrogen, air, and acetylene cylinders.

3. Minimum Requirements

	Minimum Requirements	Supporting Documentation
1.	All compressed gas cylinders must be legibly marked with the name of the gas.	Section 6
2.	The valve protective cap must be kept in place except when cylinders are in use or connected for use.	Section 6
3.	Cylinders must be stored in an upright position, secured from falling, and protected from passing or falling objects.	Section 6
4.	Cylinders must be secured in a cradle or cart for hoisting. Hoisting cylinders using chocker slings is prohibited.	Section 7
5.	Cylinders other than those containing self-contained breathing air may not be placed in confined spaces or excavations.	Section 8
6.	Oxygen and acetylene cylinders in storage must be separated by 20 feet or a non-combustible barrier.	Section 9

4. Definitions

In use—A compressed gas cylinder is considered “in use” in the following situations:

- Gas is flowing from the cylinder.
- Cylinder gas is being used to maintain pressure in a supply line.
- Cylinders are in transit.
- Cylinder is “connected for use” during and between operations using the gas.

Connected for use—A compressed gas cylinder is considered “connected for use” when personnel can assume that gas will be drawn from the cylinder within the next 24 hours from the time the cylinder is shut down. For example, at the end of a shift, the welder secures the cylinder by shutting down the valve and depressurizing the regulator and downstream equipment but does not disconnect equipment. The regulator reads “0” and welding operations will resume 15 hours later at the start of the welder’s next shift.

Cracking—The action of slightly opening and then closing the valve on a compressed gas cylinder before connecting the regulator. Cracking clears the valve of any dust or dirt that might otherwise enter the regulator.

Storage—A cylinder is considered in storage when it is not in use or in transit. Personnel must meet cylinder storage requirements when they can reasonably assume that gas will not be drawn from the cylinder within the next 24 hours from the time the cylinder is shut down.

5. Roles and Responsibilities

- A. Team Leaders are responsible for the implementation and enforcement of this policy.
- B. Employees are responsible for following all requirements detailed in this policy.

6. Storing and Handling Compressed Gas Cylinders

All USPL personnel and contractors must adhere to the following procedures.

- A. Store cylinders, whether empty or full, in an upright position (vertical valve-end up) and chained securely in place at locations specifically designated for gas cylinder storage, or secured in a specially constructed storage rack to prevent the cylinders from falling over. Close the valve and screw on the protective valve cover hand-tight.
- B. Do not store cylinders near radiators or in any other location where they may be subjected to temperatures greater than 125°F.
- C. If storing cylinders inside a building, keep the cylinder storage area clean, dry, and well ventilated. Keep cylinders at least 20 feet from highly combustible materials such as oil.
- D. Do not place gas cylinders within 6 feet of an electrical source.
- E. Limit inside storage areas for fuel gas to a total gas capacity of 2,000 cubic feet (about 13 large cylinders).
- F. Mark compressed gas cylinders legibly, for the purpose of identifying the gas content, with either the chemical or the trade name of the gas.
 - 1. Such marking shall be by means of stenciling, stamping, or labeling, and shall not be readily removable.
 - 2. Whenever practical, the marking shall be located on the shoulder of the cylinder
- G. Do not accept or use a gas cylinder unless it has a label to identify the type of gas it contains.
- H. Clearly mark empty cylinders with "EMPTY" or "MT."
- I. Ensure a list of compressed gases and associated Safety Data Sheets are included in your chemical inventory list.

7. Transporting Compressed Gas Cylinders

All USPL personnel and contractors must adhere to the following procedures.

- A. Never suspend cylinders from a sling, rope, or chain.

- B. When lifting cylinders, fasten them securely in a cradle or cart. Do not use valve protection caps for lifting cylinders from one vertical position to another. Hoisting cylinders using chocker slings is prohibited.
- C. Move cylinders by tilting and rolling them on their bottom edges, not by sliding or dragging them, when a cradle or cart is not used. Do not drop cylinders or allow them to strike against each other.
- D. When transporting compressed gas cylinders over public roads, remove the regulators and replace the protective caps and secure them in a vertical position.
- E. Before moving and while transporting a cluster of compressed gas bottles hooked to a common manifold, secure the cluster by shutting all valves.
- F. Use a suitable cradle, boat, or platform (but never slings or electric magnets) when transporting cylinders by a crane or derrick.

8. Using Compressed Gas Cylinders

All USPL personnel and contractors must adhere to the following procedures.

- A. Use cylinders only in an upright position and secure them to prevent them from falling.
- B. Never install regulators or other unions to a cylinder unless the threads correspond with those on the cylinder valve outlet. Do not force connections that do not readily fit and do not use adapters.
- C. Before using a cylinder, read the label to identify the cylinder contents and verify that the contents are proper for the intended service. Observe all safety precautions set forth on the cylinder label. If the label is illegible or missing, do not assume the cylinder contains a particular product; return the cylinder to the supplier.
Note: Remember, the color of the cylinder does not indicate the contents.
- D. Before a regulator is connected to a cylinder valve, clear the valve by cracking it (i.e., open it slightly and close it immediately). Before cracking the valve, stand to one side of the outlet, not in front of it. Do not crack the valve of a fuel gas cylinder in any area where the gas could reach a possible source of ignition. **The cylinder valve shall always be opened slowly.**
- E. A hammer or wrench shall not be used to open cylinder valves. If valves cannot be opened by hand, the supplier shall be notified.
- F. When using manifolds, be sure they are rated for the cylinder pressure and are compatible with the product. Never connect cylinders of different working pressures to the same manifold, as this could result in a backflow of high-pressure gases into a cylinder designed for lower pressures.
- G. Never attempt to fill a cylinder, transfer gas from one cylinder to another, or mix any gases in a cylinder.
- H. Never use cylinders for rollers, supports, or for any purpose other than to hold gas.
- I. Identify defective cylinders and return to the vendor for repair.
- J. When working inside tanks, vessels, or other confined spaces, do not take cylinders other than self-contained breathing apparatus (SCBA) cylinders inside the confined space or excavation.
- K. At the end of the workday or prior to a prolonged absence from the job, remove the regulator, secure the cylinder valves, and replace the protective caps. When returning empty cylinders, close the valve and install the cap before moving the cylinder.
- L. Never tamper with the safety devices on valves or cylinders.
- M. Never drop cylinders or allow them to strike against each other.
- N. Never attempt to repair or alter cylinders or valves.

- O. In choosing regulators, hoses, liquid transfer lines, and other equipment, follow the manufacturer's recommendations regarding sizing, rating, and application.

9. Special Procedures

All USPL personnel and contractors must adhere to the following procedures.

9.1. Oxygen Cylinders

- A. Separate any oxygen cylinders from fuel-gas cylinders (e.g., acetylene) by at least 20 feet or by a non-combustible barrier when stored. This barrier must be at least 5 feet high and have a fire resistance rating of at least one-half hour.

Note: This requirement applies to welding and cutting apparatus as well. When not “in use,” the oxygen and acetylene cylinders must be separated or have a non-combustible barrier between them. Storage of the cylinders is not permitted on the transportation cart.

- B. Never permit oil or grease to come in contact with oxygen cylinders, valves, regulators, gauges, or fittings, such as by handling with oily gloves; a violent reaction will occur.
- C. Open the cylinder valves fully when the cylinder is in use in order to properly backseat the valve.
- D. Never use oxygen to run pneumatic tools, blow out pipes, dust off clothing, or ventilate an area. A violent reaction may occur.

9.2. Acetylene Cylinders

- A. Never use acetylene at a pressure exceeding 15 psig or 30 psia.
- B. Do not open the valve of an acetylene cylinder more than one and one-half turns, and preferably no more than three-quarters of a turn. In case of a fire, the valve can be closed quickly.
- C. Purge the oxygen and acetylene passages individually before lighting the torch.
- D. Never perform any welding, burning, heating, or cutting operation without the flashback arrestors. Flashback arrestors must be installed internal to the torch head or separately at the inlet to the torch head.
- E. Always store and use acetylene cylinders in a vertical position.

10. Training

- A. Individuals who use compressed gas cylinders shall receive training in their use, handling, and storage.

11. References

1. OSHA, Department of Labor, 29 CFR 1910.101, “Compressed Gases (General Requirements)”; 1910.253, “Oxygen–Fuel Gas Welding and Cutting”; and 1926.350, “Gas Welding and Cutting.”
2. ANSI, Z49.1, “Safety in Welding, Cutting, and Allied Processes.”
3. Compressed Gas Association, P-1, “Safe Handling of Compressed Gases in Containers.”