



## University Facilities Handling and Storage of Compressed Gas Cylinders Policy

### *University Facilities (UF)*

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Approved by: Bob Wells

#### I. POLICY

The policy of Clemson University Facilities (UF) is to ensure that standard procedures necessary to protect personnel and equipment be followed for Handling and Storage of Compressed Gas Cylinders.

#### II. SCOPE

This standard covers the general procedures for safe handling and storage of all compressed gas cylinders and provides recommended safe practices for the handling of oxygen and acetylene cylinders.

#### III. DEFINITION OF TERMS

- A. Compressed Gas Cylinder - A vessel made to DOT specifications used to store a specific commercial compressed gas.
- B. Types of Gases Used
  - 1. True gases such as oxygen, nitrogen and helium which expand when heated.
  - 2. Liquefied gases such as CO<sup>2</sup>, propane, and Freon which have been compressed above their respective critical pressure and are mostly liquefied.
- C. Cylinder Type Pressure Regulator - An instrument designed to regulate the pressure and flow from a cylinder to the point of usage.
- D. DOT - Department of Transportation - Regulates transportation of compressed gas cylinders classes as hazardous materials and establishes mandatory requirements.

#### IV. RESPONSIBILITY

- A. It is the responsibility of area managers to ensure the safety procedures as outlined here are made known to persons using compressed gas cylinders and that correct equipment is provided to implement them.
- B. It is the responsibility of persons using compressed gas cylinders to comply with the following procedures.

#### V. PROCEDURE

- A. General
  - 1. When cylinders arrive on the UF site, the receiving person visually checks the cylinders to ensure that they are in proper condition and safe for the purpose

intended. In order to keep them in this safe condition, they should not be abused on the job.

2. Only cylinders carrying DOT markings are to be used in UF.
3. It is illegal to tamper with numbers and markings stamped into the cylinder walls.
4. While cylinders are being moved, keep them from being knocked over or from falling. When moving cylinders by crane or derrick, use a suitable cradle, boat or platform. Never use slings or an electric magnet.
5. Whenever practical, suitable trucks should be provided for conveying and handling cylinders. The cylinders should always be chained in upright position or blocked in a horizontal position.
6. Unless cylinders are on a suitable truck, regulators should be removed and a valve protection cap should be put in place when cylinders are moved. Always close cylinder valves before moving cylinders.
7. Never use the original or any modified valve protection cap for lifting cylinders.
8. Never use cylinders as rollers or supports even if they are considered to be empty.
9. Full cylinders should be used in the order received from the supplier.
10. Keep cylinders from being knocked over while in use. Use a suitable truck, chain or other steadying device.
11. Never allow cylinders to come in contact with live wires, third rails or ground wires from electrical equipment.
12. Keep cylinders far enough away from the welding or cutting work so that sparks, hot slag or flame will not reach them.
13. Always close cylinder valves when work is finished, and always close valves of empty cylinders while in storage prior to return to supplier.
14. Return empty cylinders, with caps replaced, to the appropriate storage area.
15. Use only regulators, pressure gauges, manifolds, and related equipment which are appropriate for a particular type gas cylinder. Never tamper with nor attempt to modify, repair, or adapt regulators, pressure gauges, manifold, and related equipment.
16. Cylinders must not be left exposed to chemicals, fumes, or extremes of weather long enough to result in corrosion or rust of any parts.
17. If a leak develops in a cylinder, if practical, move it to an area away from traffic, rope off and identify the area as appropriate, and activate necessary emergency procedures by calling 911.
18. Never permit any open flame to come into contact with any part of a cylinder.
19. Do not drop any cylinder or handle it roughly.
20. Open cylinder valve slightly at first so as not to risk damaging regulator and stand away from front of regulator.

## B. Oxygen Cylinders

1. Never use oxygen for compressed air since a spark might quickly start a fire.
2. Keep oxygen cylinders and fittings away from oil, grease and hydrocarbon solvents since these substances may ignite violently in presence of oxygen under pressure.
3. Do not store oxygen cylinders near reserve stocks of acetylene or other fuel gas cylinders or substances likely to cause or accelerate fire. Also, they are not to be stored near furnaces, radiators, or any other source of heat.
4. Never use oxygen from a cylinder except through an oxygen pressure - reducing regulator.
5. Do not use hammer or wrench to open oxygen cylinder valves. If valves cannot be opened by hand, return the cylinders to stores and notify the stores personnel of the condition.
6. When a pressure-reducing regulator is attached, open the oxygen cylinder valve slightly at first - then open it all the way. If the high pressure is suddenly released, it may damage the regulator.
7. Never tamper with nor attempt to repair oxygen cylinder valves or regulators.

## C. Acetylene Cylinders

1. Always stand acetylene cylinders with valve end up. Acetylene cylinders should never lie on their sides when in storage or while being used.
2. Never tamper with fusible plugs. These plugs are provided on all acetylene cylinders and act as safety releases when exposed to excessive temperature.
3. Should the valve outlet become clogged with ice, thaw with warm water.
4. Always use the special T-wrench or key for opening or closing the cylinder valves. Leave these wrenches in position, ready for immediate use, so acetylene can be turned off quickly in case of emergency.
5. Do not open an acetylene cylinder valve more than one and one-half turns which permits an ample flow.
6. Do not store tools in the recessed top of cylinder.

## D. Storage of Cylinders

1. Store all cylinders in an upright position, on a level fireproof floor, and make them secure with a chain or other substantial device.
2. Full and partially full cylinders must be stored separate from empty cylinders to avoid confusion.
3. Full, partially full, and empty cylinders must be marked by a tag indicating the level of contents.
4. Use and store cylinders of all gases only in a well ventilated area.
5. Liquefied gases should be isolated from other bottle gases.

6. Valves should be closed on all stored cylinders and valve caps should be in place.
7. Cylinders should be protected against snow and ice in the winter and screened against continuous direct rays of the sun in the summer.
8. To prevent rusting, cylinders stored in the open should not be in contact with the ground.

VI. REFERENCES

OSHA Standard 1910.101 – Storage and Handling of Liquefied Petroleum Gases  
OSHA Standard 1910.252 – Welding, Cutting and Brazing, General Requirements  
OSHA Standard 1910.253 – Oxygen-fuel Gas Welding and Cutting