



UNIVERSITY OF
NORTHERN COLORADO

Environmental Health and Safety

Compressed Gas Cylinder Safety Guidelines

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TABLE of CONTENTS

- I. Purpose
- II. Responsibilities
- III. Labeling and Markings
- IV. Storage and Use
- V. Transportation
- VI. Training

Appendix:

- A. Compressed Gas Cylinder Marking/Labeling Requirements



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Compressed Gas Cylinder Safety Guidelines

I. Purpose

Compressed gas cylinders used for a variety of purposes on campus have the potential to create hazardous conditions for employees, students, and damage to facilities. The purpose of this guideline is to inform users of the proper storage, labeling, usage, and transportation of compressed gas cylinders used on campus

Cylinders can present many types of hazards as they hold a wide variety of materials such as gases or liquids that are flammable, combustible, pyrophoric, corrosive, poisonous, inert, etc. For example; a sudden release of gas could cause a cylinder to become a missile-like projectile and a leak in a cylinder could release potentially health hazards contributing to fire hazards when those gases are flammable. This information within this guideline applies to all compressed gas cylinders.

II. Responsibilities

Due to the hazards of handling, storing, and transporting compressed gas cylinders all University faculty, staff, and students handling compressed gas cylinders shall follow this guide.

A. Supervisors

As a supervisor of employees handling cylinders, supervisors shall:

- Notify the supplier to pick up empty cylinders.
- Ensure that all guidelines are being followed by faculty, staff, and students.
- Ensure all individuals who may fall under the direction of these guidelines receive the proper training in the handling, storage, and transportation of compressed gas cylinders.
- Check the quality of cylinders and compressed gas systems (including valves, regulators, labeling and piping of systems).
- Coordinate with the appropriate person with the supply company for changing out compressed gas cylinders that are due for recertification according to DOT standards and applicable types of cylinders.

B. Faculty, Staff and Students

As University personnel who handle cylinders shall:

- Notify their supervisor of any injury directly related to a compressed gas cylinder.
- Notify their supervisor if a leaky, rusted, cracked or corroded cylinder or piping system is discovered.
- Notifying their supervisor of any damage to or missing labels on cylinders.
- Notify their supervisor when cylinders are empty.

III. Labeling and Markings

Compressed gas cylinders must be properly labeled so that it can be seen from any approach to the cylinder. Labels must be read and confirmed before using a cylinder.

Labels shall be readable at all times while in service. If any label is damaged, missing, or tarnished in any way, the cylinder shall be taken out of service until the label is replaced.

Never rely on the color of a label or cylinder for identification due to differences in color-coding between suppliers. If the contents cannot be identified, the user must label the cylinder as "contents unknown" and move the cylinder to the empty storage area. Labeling should include the name of the material and the hazard identification via NFPA Diamond (blue=health, red=flammability, yellow=reactivity, white=special instructions) or the proper DOT shipping label with appropriate placards as prescribed in the Compressed Gas Associations C-7 Pamphlet.

Appendix A of this guideline is an informative description of the meanings of the markings on cylinders for compliance purposes only. The "3 in 1" labels are intended for example purposes and may be slightly different. All DOT classifications are per federal regulations and are meant for informational purposes, so the handler of the cylinder may recognize hazards associated with each gas contained within.

IV. Storage and Use

Compressed gas cylinder users shall adhere to the following storage requirements to ensure the safety of all personnel:

- Areas, where cylinders are stored, must be secured against unauthorized personnel.
- Cylinders must be upright and secured at all times to prevent tipping. This can be achieved through the use of floor stands, bolted wall straps, chaining to a rack, etc.
- Cylinders must be stored in a dry, well-ventilated area.
- Cylinders shall be capped when not in use or attached to a system or structure.
- When in use valves on the cylinders must be accessible at all times.

- Cylinders containing gases with the same hazards shall be stored together.
- Do not store cylinders in routes of exit or egress, near an elevator, or by an unprotected ledge.
- Flammable gases must not be stored near open flames or where electrical sparks could occur.
- Oxygen cylinders must not be stored near fuel-gas cylinders or combustible materials.
- Empty and full cylinders shall be stored in separate areas. An empty cylinder is one whose internal pressure equals atmospheric pressure.

The following usage requirements shall be followed to help the safety of personnel handling compressed gas cylinders:

- Regulator and valve fittings shall always be checked for compatibility.
- Eye protection shall be worn when handling compressed gas cylinders.
- Check the Safety Data Sheets for additional personal protective equipment required for the gas contents of the cylinder.
- Tools provided by the supplier shall be used to open valves.
- The valve shall be opened slowly away from the handler's face, then closed as soon as it is no longer being used.
- Pressure relief devices shall be used to protect cylinders from rupture in the event of overpressure.
- Never empty a cylinder below 100 psi to prevent residual contents from becoming contaminated and potentially causing a harmful reaction.

V. Transportation

Proper handling must be observed when transporting compressed gas cylinders. Only trained employees or supplier personnel are allowed to transport compressed gas cylinders (see section VI. Training).

A. Hand Transportation

Cylinders should not be subjected to rough handling or banging, i.e. rolled or dragged as a means of transport. Cylinders shall be moved one at a time, on an approved dolly or cart, strapped down to ensure transport stability. If traveling long distances, they shall be capped to avoid hazards in case the cylinder falls.

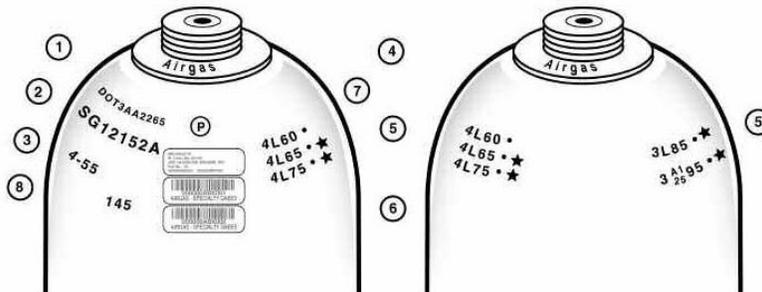
B. Vehicle Transport

Transporting gas cylinders by vehicles adds an extra element of danger to an already dangerous process. Always ensure cylinders are properly labeled, capped and are secured in an upright position within the vehicle. Cylinders shall only be transported in work vehicles that utilize them during their scope of work being performed.

VI. Training and Record-Keeping

Individuals using compressed gases must be trained in the safe use and handling of cylinders and pressurized systems. Also, the individual shall complete the University Hazard Communications training. Environmental Health and Safety is available to assist if requested. Departments shall maintain training records for a minimum of three years.

Appendix A – Compressed Gas Cylinder Marking/Labeling Requirements



Markings

Specialty gas cylinders are stamped with markings designed to indicate ownership, specifications, pressure ratings, and other important data. Most companies also utilize a bar code label for product identification and tracking.

1. Cylinder Specification:

- Department of Transportation (DOT) Serial Number that specifies the cylinder type (e.g., 3AA.) and working pressure (e.g., 2,265 psig).

2. Cylinder Serial Number

3. Date of Manufacture:

This date (month-year) also indicates the original hydrostatic test.

4. Neck Ring Identification:

The cylinder neck ring displays the name of the original owner of the cylinder.

5. Retest Markings:

- The format for a retest marking is Month – Facility – Year – Plus Rating – Star Stamp.
- The + symbol (Plus Rating) indicates that the cylinder qualifies for a 10% overfill.
- The H symbol (Star Stamp) indicates that the cylinder meets the requirements for a 10-year retest, instead of a 5-year retest.

6. Bar Code Label:

The bar code label provides a unique cylinder identifier and is used by computer systems to track cylinders throughout the filling process. As an optional service, we have the capability of tracking cylinders to and from customers.

7. Cylinder Manufacturer's Inspection Marking

8. Cylinder Tare (Empty) Weight:

This value may be preceded by the letters TW.

Label Example "3 in 1"



D.O.T. Classifications

Your compressed gas cylinders will have one or more of the hazardous materials placards shown below

All cylinders will fall into Class 2 (Compressed Gases) and may have subsidiary classes that will encompass Class 5 (Oxidizers), Class 6 (Poisons), and Class 8 (Corrosives) if applicable.

DOT Placards

