



Compressed Gases

Description

This standard operating procedure outlines the handling and use of compressed gases. Compressed gases come in a large variety of sizes and pressures. Review this document and supply the information required in order to make it specific to your laboratory. In accordance with this document, laboratories should use appropriate controls, personal protective equipment, and disposal techniques when handling compressed gases.

A compressed gas is any mixture or material in a container with either an absolute pressure exceeding 40 psi at 70°F or an absolute pressure exceeding 104 psi at 130°F. Any liquid flammable material having a vapor pressure exceeding 40 psi at 100°F is also considered a compressed gas.

Potential Hazards

The large amount of potential energy contained in a compressed gas cylinder makes it a potential rocket or bomb if the pressure is released through rupture of the valve or container failure.

Compressed gases may also be toxic, flammable, or explosive – check the safety data sheet for more information. Safety considerations for these properties must also be followed.

Engineering Controls

Storage of compressed gas cylinders requires sturdy chains secured to a wall or cabinet, and/or a cylinder stand. If the process does not permit gas use and/or storage in well-ventilated areas (i.e., lab ventilation having a minimum of 6 air changes per hour), contact EHS at (313) 593-0921 to determine the necessity of an oxygen-deficiency monitor or other alarm devices.

Work Practice Controls

All compressed gas cylinders shall be legibly marked by stenciling, stamping, or label with at least the chemical name or commonly accepted name of the material contained. In addition, cylinders should bear the approved markings of the Department of Transportation stamped in the metal at the top of the cylinder.

- Check connections and hoses regularly for leaks using a specific monitoring instrument or soapy water (or equivalent).
- When using highly flammable or toxic gas, check the delivery system using an inert gas prior to introducing the hazardous gas.
- When using compressed acetylene: (i) do not exceed a working pressure of 15 psig, and (ii) do not use vessels, piping, or other materials that contain a significant amount of copper (usually considered to be more than 50% copper).
- Replace valve caps when cylinders are not in use or before moving.
- Remove damaged or defective cylinders from service (contact the cylinder vendor for assistance).
- Remove unused or empty cylinders from lab space.

- Refer to the EHS [Compressed Gas Use](#) webpage or consult EHS representative regarding maximum allowable quantities of compressed gases.

Restricted hazardous gas use **must** be approved by EHS for purchase. Refer to the hazard guideline for compressed gas use on the EHS website.

Protective Equipment

Safety glasses must be worn for all work involving compressed gas cylinders. Cylinders must be secured to a gas cylinder mount, bracket, or clamp. These securing devices must be attached to a stable surface such as a permanent bench top or a wall.

Transportation and Storage

- Cylinders (full or empty) shall be secured by chains, straps, or other sturdy tiedowns during storage and transport.
- Cylinders shall be grouped by type of gas, and the groups segregated as to compatibility.
- Full cylinders shall be separated from empty cylinders within the storage area.
- Flammable gases shall be separated from nonflammable gases.
- Cylinders shall not be stored at temperatures above 125 °F. or in direct sunlight, or outside of the temperature range specified by the manufacturer.
- Cylinder valves shall be kept closed when not in use.
- Removable caps shall be kept on cylinders at all times, except when cylinders are in use.
- Cylinders shall be protected against tampering and damage.
- Cylinders shall not be stored near combustible materials.
- Cylinders shall not be refilled except by authorized suppliers.
- Open flames and smoking shall not be permitted in areas where oxygen is used or stored. "No Smoking" and "No Open Flames" signs shall be conspicuously posted in these areas.
- Cylinders, except for those containing compressed air, shall not be used or stored in cold rooms or other unventilated enclosures. An exception may be approved by OSEH for inert gases when an oxygen monitor is in place.

Waste Disposal

In most cases, the compressed gas cylinder, including any unused gas, will be returned to the vendor from which the cylinder was purchased. Contact EHS at (313) 593-0921 to arrange for the removal of gas cylinders that cannot be returned to the supplier. Write "empty" on the outside of each cylinder and complete a hazardous waste manifest.

Exposures/Unintended Contact



If the employee is in need of emergency medical attention, call 911 immediately.



Report all work related accidents, injuries, illnesses or exposures to WorkConnections within 24 hours by completing and submitting the [Illness and Injury Report Form](#). Follow the directions on the WorkConnections website [Forms Instructions](#) to obtain proper medical treatment and follow-up.

Complete the [EHS Laboratory Incident and Near-Miss Report](#) form.

TREATMENT FACILITIES:

Midwest Medical Center -- *Campus Employees (including student employees)*

Mon-Fri 7:30 am - 4:30 pm

9301 Middlebelt Road

Romulus, MI 48174

Phone: 734-941-1000

After hours - go to:

Midwest Medical Center

Open 24/7

4700 Schaefer

Dearborn, MI 48126

Phone: 313-581-2600

Henry Ford Medical Center-Fairlane -- *University students (non-life threatening conditions)*

19401 Hubbard Drive

Dearborn, MI 48126

Phone: 313-928-8278

Click [here](#) for more information.

Report all emergencies, suspicious activity, injuries, spills, and fires to Public Safety by calling at (313) 593-5333 or 911 from a campus phone. Register with the University of Michigan-Dearborn [Emergency Alert System](#).

Training of personnel

All personnel are required to complete the ***Comprehensive Laboratory Safety*** session (**BLS009** or equivalent) via [OSEH's My LINC website](#). Furthermore, all personnel shall read and fully adhere to this SOP when handling and using compressed gases.

Certification

I have read and understand the above SOP. I agree to contact my Supervisor or Lab manager if I plan to modify this procedure.

Name	Signature	UM ID #	Date

Prior Approval required – Is this procedure hazardous enough to warrant prior approval from the Principal Investigator? ☐ YES ☐ NO

Principal Investigator _____

Revision Date _____