



UNIVERSITY SAFETY OFFICE

SUBJECT

Safe Handling of Compressed Gases and Compressed Gas Cylinders

I. PURPOSE

To establish guidelines for the use, storage and transit of compressed gases and compressed gas cylinders

II. SCOPE

This policy applies to all users of compressed gases at Sam Houston State University, including visitor and contractors.

III. REQUIREMENTS

The employees of Sam Houston State University shall not purchase compressed gas cylinders for use on campus. Compressed gases shall be purchased from the authorized vendor and the cylinder rented from the same.

Compressed gas cylinders should be handled only by those familiar with the hazards and who are trained in the proper handling techniques. Cylinders containing compressed gases are heavy and awkward to move. Improper handling of compressed gas cylinders can result in sprains, strains, falls, bruises, or broken bones. Other hazards such as fire, explosion, chemical burns, poisoning, and cold burns could occur if gases accidentally escape from the cylinder due to mishandling.

Take the following precautions to prevent accidents caused by the improper handling of compressed gas cylinders:

Moving Compressed Gas Cylinders

NEVER

Move a cylinder with out the safety cap in place

- Drag or slide cylinders, even for short distances.
- Drop cylinders or permit them to strike each other violently.
- Subject cylinders to mechanical shocks that may cause damage to their valves.
- Use cylinders as rollers for moving material or other equipment.
- Tamper with pressure-relief devices.
- Permit oil, grease, or other readily combustible substances to come in contact with cylinders, valves, or other equipment in oxidizer service.
- Remove any product labels or shipping hazard labels.
- Refill compressed gas cylinders. This is to be done only by qualified producers of compressed gases.
- Lift a cylinder by its cap using a sling or a magnet.
- Attempt to catch a falling cylinder.

ALWAYS

- Move cylinders using a suitable hand truck or cart.
- Leave the valve protection cap and valve seal outlet in place until the cylinder has been secured in place and is ready to be used.
- Secure cylinders when in storage, transit, or use.

- When returning cylinders to the supplier, properly close the cylinder valve, replace and secure any valve outlet seals, and properly install the cylinder cap.

Storing Compressed Gases - Take the following precautions to prevent injuries caused by asphyxiation, fire, explosion, high pressure, and improper handling of compressed gas cylinders:

NEVER

Allow storage temperature to exceed 125°F (52°C).

- Permit smoking or open flames in oxidizer or flammable gas storage areas.
- Expose cylinders to corrosive materials such as ice melting compounds.

ALWAYS

Secure cylinders when in storage, transit, or use.

- Store cylinders upright with valve outlet seals and valve protection caps in place.
- Store cylinders in areas designated for that purpose.
- Segregate full and empty cylinders.
- Store cylinders in a dry, cool, well-ventilated, secure area protected from the weather and away from combustible materials.
- Ensure that there is adequate separation from combustibles as specified by national regulations. • Monitor the atmosphere in areas where gases may vent and collect.
- Use a first-in, first-out (FIFO) inventory system to prevent full containers from being stored for long periods of time.
- Store only the amount of compressed gas required for the specific application.
- Store cylinders away from heavily traveled areas and emergency exits.
- Provide adequate access for cylinder handling.
- Visually inspect stored cylinders on a routine basis, or at least weekly, for any indication of leakage or problems.
- Restrict access to cylinder storage areas.
- Protect cylinders from wet or damp ground.

Proper Use of Compressed Gases - Take the following precautions to prevent accidents caused by the improper handling of compressed gases:

NEVER

Disable a pressure relief valve or device

- Attempt to mix gases in a cylinder.
- Insert an object (e.g., wrench, screwdriver, etc.) into valve cap openings to remove a stuck cylinder cap. Doing so may damage or open the valve, causing a leak to occur. Use an adjustable strap-wrench to remove over-tight or rusted caps.
- Permit cylinders to become part of an electrical circuit.
- Use oxygen as a substitute for compressed air.
- Strike an arc on a cylinder.
- Return product into a cylinder.
- Introduce another product into a cylinder.
- Use cylinder color as a primary means to identify the contents of a cylinder.
- Heat a cylinder to increase its pressure or withdrawal rate unless using an approved method.
- Discharge the contents from any gas cylinder directly toward any person.
- Refill any non-refillable cylinder after use of the original contents.
- Force cylinder valve connections that do not fit.
- Reduce the residual pressure of a cylinder below the operating pressure of the system or 7 psig (0.5 bar),

whichever is higher.

- Change service of equipment from the particular gas or group of gases for which they were intended.

ALWAYS

Know and understand the gases and associated equipment you will be using. Refer to the supplier's MSDS to determine the proper PPE and any other special requirements for the gas being used.

- Use a pressure-reducing regulator or separate control valve to safely discharge gas from a cylinder.
- Use regulators approved for the specific gas.
- Leak-test lines and equipment with an inert gas before using.
- Use regulators and pressure-relief devices when connecting cylinders to piping circuits with lower pressure service ratings.
- Use check valves to prevent reverse flow into the cylinder.
- Loosen the valve outlet seal slowly when preparing to connect a cylinder.
- Open cylinder valves slowly and carefully after the cylinder has been connected to the process.
- Stand clear of the regulator and valve outlet while opening the valve.
- Prevent sparks and flames from contacting cylinders.
- Discontinue use and contact the supplier if a cylinder valve is difficult to operate. Wrenches should not be used on valves equipped with hand wheels. If the valve is faulty, tag the cylinder, identifying the problem, and notify the supplier.
- Close the cylinder valve and release all pressure from the downstream equipment connected to the cylinder anytime an extended non-use period is anticipated.
- Use oxygen-compatible threading compounds, such as Teflon® tape on systems for use in oxygen or oxidizer service.
- Remember, the cylinder label or decal is the only positive way to identify the contents of a cylinder.