

Compressed gas cylinder safety



INTRODUCTION

The information below includes safety guidelines and rules to help ensure the safe handling and storage of compressed gas cylinders. Compressed gases are found and used in a variety of businesses, but are most common in manufacturing, service and repair, and construction operations. Gases under high pressure present a number of hazards.

Mishandled cylinders can rupture, releasing hazardous contents or become dangerous projectiles. If the neck of a pressurized cylinder was accidentally broken off, the energy released would be sufficient to propel the cylinder to over three-quarters of a mile in height. A standard, 250 cubic foot pressurized cylinder, can attain speeds of over 30 mph in a fraction of a second after venting from the broken cylinder connection.

COMPRESSED GAS SAFETY

- Select the least hazardous gases that will work.
- Purchase only the necessary quantities.
- When receiving gas cylinders, personnel should:
 - Check for leaks.
 - Visually inspect the cylinder for damage.
 - Ensure the valve cover and shipping cap are on.
 - Check for proper labeling.
 - Contact your cylinder vendor and have them return the damaged cylinder to the manufacturer, if a cylinder is damaged, in poor condition, leaking or the contents are unknown.
 - Wear appropriate foot protection when engaging in moving or transporting cylinders.
 - Wear proper personal protective clothing and equipment.
 - Always have an appropriate Safety Data Sheet (SDS) available and be familiar with the health, flammability and reactivity hazards for the particular gas.

The information contained in this service bulletin was obtained from reliable sources. However, United Fire Group accepts no legal responsibility for the correctness or completeness of this information.

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CYLINDER MARKINGS

- Cylinders must be properly labeled, including the gas identity and appropriate hazards (e.g., health, flammability, reactivity).
- Cylinders have several stamped markings. The top mark is either a Department of Transportation (DOT) or an International Code Council (ICC) marking indicating pertinent regulations for that cylinder. The second mark is the serial number. Under the serial number is the symbol of the manufacturer, user or purchaser. Of the remaining marks, the numbers represent the date of manufacture and retest date (month and year). A plus (+) sign indicates the cylinder may be 10 percent overcharged and a star indicates a 10-year test interval.

CYLINDER STORAGE

Cylinders contain various types of gases and some of these gases are incompatible with each other. Therefore, the required separation should be provided. Cylinders should be separated and/or stored as follows:

- Flammables should be separated from oxidizers.
- Corrosives should be separate from flammables.
- Full cylinders should be separated from empty cylinders.
- Empty cylinders should be clearly marked and stored as carefully as those that are full because residual gas may be present.
- All cylinders should be protected from corrosive vapors.
- Cylinders should be stored in an upright position.
- Oxygen cylinders should be stored a minimum of 20 feet from flammable gas cylinders or combustible materials. If this is not possible, then separation is required by a non-combustible barrier at least 5 feet high and having a fire rating of at least 30 minutes.
- Compressed gas cylinders should be firmly secured at all times. A clamp and belt or chain, securing the cylinder between “waist” and “shoulder” to a wall, are generally suitable for this purpose.
- Cylinders should be individually secured; using a single restraint strap around a number of cylinders is often not effective. Cylinder storage racks are designed for proper upright storage and can be fabricated or purchased.
- Valve protective caps should be in place when the cylinder is not in use.
- Empty cylinders should be marked empty or MT.
- Valves should be closed on empty cylinders.
- Cylinders should be stored or used away from sources of heat.
- Cylinders should not be stored or used near electrical wiring where the cylinder could become part of the circuit.
- Cylinders should be stored in well-ventilated areas designated and marked only for cylinders.

MOVING CYLINDERS

- A cylinder cart with cylinders secured by a chain should be used.
- The protective valve caps should not be used for moving or lifting cylinders.
- Avoid dropping cylinders, permitting them to strike each other violently, or be handled roughly.
- Cylinders should be secured on a special cart. If this is not possible, regulators shall be removed, valves closed and protective valve caps in place before moving cylinders.

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SAFE CYLINDER USE

- Be sure all connections are tight. Use soapy water to locate leaks.
- Keep cylinders valves, regulators, couplings, hoses and apparatuses clean and free of oil and grease.
- Keep cylinders away from open flames and sources of heat.
- Safety devices and valves shall not be tampered with, nor repairs attempted.
- Use flashback arrestors and reverse-flow check valves to prevent flashback when using oxy-fuel systems.
- Regulators shall be removed when moving cylinders, when work is completed, and when cylinders are empty.
- Cylinders shall be used and stored in an upright position.
- Cylinder valves should always be opened slowly. Always stand away from the face and back of the gauge when opening cylinder valves.
- When a special wrench is required to open a cylinder or manifold valve, the wrench shall be left in place on the valve stem when in use. This precaution is taken so the gas supply can be shut off quickly, in case of an emergency, and so nothing can be placed on top of a cylinder that may damage the safety device or interfere with the quick closing of the valve.
- Fire extinguishing equipment should be readily available when combustible materials can be exposed to welding or cutting operations using compressed cylinder gases.

COMPRESSED GAS CYLINDER NO-NOS

- Do not roll a cylinder to move it.
- Do not store cylinders on their sides or in piles or when transporting in a vehicle.
- Do not carry a cylinder by the valve.
- Do not leave an open cylinder unattended.
- Do not leave a cylinder unsecured.
- Do not force improper attachments on to the wrong cylinder.
- Do not grease or oil the regulator, valve, or fittings of an oxygen cylinder.
- Do not refill a cylinder.
- Do not use a flame to locate gas leaks.
- Do not attempt to mix gases in a cylinder.
- Do not discard pressurized cylinders in the normal trash.

SUMMARY

Pressurized cylinders pose unique exposures to loss from both a personal injury and property damage perspective. The proper handling, use and storage of pressurized cylinders is essential in preventing these types of losses. For additional assistance regarding compressed gas cylinder safety, please contact your United Fire Group loss control representative.

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