



Environmental Health and Safety Office

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COMPRESSED GAS SAFETY GUIDE

Version	Date	Comments
3	August, 2011	Updated <i>Compressed Gas Safety Guide</i> (minor changes)

A. SUMMARY

The purpose of this Guide is to provide information to employees regarding the proper use and handling of compressed gas cylinders. This Guide is based upon Occupational Safety and Health Administration (OSHA) Standard 29 CFR1910.101 Subpart H: *Hazardous Materials*, International Fire Code regulations, and Compressed Gas Association standards.

B. SCOPE

This Guide applies to all George Mason University employees who work with or around compressed gas cylinders. A compressed gas cylinder is any cylinder specifically designed to contain gases under pressure of greater than one atmosphere, and has the capability of dispensing the gas by means of a control valve mechanism to assure the safe and proper use of the gas. Compressed gas cylinders will be henceforth referred to as cylinders.

C. CYLINDER IDENTIFICATION

- All cylinders (empty or filled) must be clearly marked with a manufacturer's or distributor's label, identifying their contents and safety precautions.
- All storage areas must be marked with signs identifying the name(s) of the cylinder(s) they contain, unless all cylinder labels are legible from outside of the storage area.
- All empty cylinders must be tagged "**Empty**".
- Do not paint cylinders as color codes are often used to help identify cylinder contents.

D. CYLINDER STORAGE

- Store cylinders in the upright position. **Acetylene cylinders must never be placed on their sides.**
- Separate cylinders by hazard class and away from electrical connections, incompatible gases, corrosive chemicals, sources of ignition, and highly flammable substances (such as oil, gasoline, combustible waste, and/or other ignitable substances) when in storage.
 - Oxygen and flammable cylinders must be separated by a minimum distance of 20 feet when in storage or be separated by a firewall at least five feet high with a fire rating of 30 minutes.
 - Full cylinders must be segregated from empty cylinders.
- Cylinders must be protected from physical damage by guards or other acceptable means.

- Cylinders must be secured to prevent falling by using a restraint, cart, nesting, or rack.
- While in storage, cylinder valves must be protected by a cap.
- Store cylinders where they are protected from the ground and moisture to prevent rusting.
- Cylinders stored outdoors must be protected from the elements.
- Do not store gas cylinders in areas where they will block egress, emergency exits, or otherwise obstruct pedestrian traffic.

E. HANDLING CYLINDERS

- Always wear appropriate personal protective equipment (PPE) as recommended by the material safety data sheets (MSDS) when handling cylinders.
- Cylinder valves must be protected from physical damage by means of a protective cap, collar, or other similar device while in storage and during transport.
- When moving a cylinder, an appropriate hand cart or dolly must be used. Cylinders must not be moved greater than one arms length by hand. Never drag, roll, slide, or carry a cylinder by the valve.
- All cylinders must be equipped with safety pressure relief valve or other approved pressure regulating device.
- Inspect cylinders regularly for corrosion, cuts, dents, and any other damage which may affect operation. If damage is observed, cylinder must be taken out of service and returned to the vendor.
- Inspect distribution lines for cracks, leaks, kinks, and other damage. Damaged distribution lines must be replaced immediately.
- Do not repair, refill, or alter the cylinder, valve, or safety relief devices. Filling, alterations, and repairs to the cylinder can only be performed by the compressed gas manufacturer or vendor.

F. CYLINDER USE AND OPERATION

- Never use a wrench or other tool to open or close cylinder valves.
- When opening a cylinder valve, stand with the cylinder between yourself and the regulator, and point hoses, piping, equipment, and gauges away from the body. Open cylinder valves slowly.
- Hoses, piping, regulators, and connections to cylinder valves must fit properly and not leak.
- Clearly label all distribution lines and their outlets.
- All hoses, piping, regulators, and connections must be compatible with the gas used and able to withstand operating pressures.
 - Refer to the MSDS and follow manufacturer's directions when attaching distribution lines and regulators to a cylinder. Not all distribution lines are compatible with all types of compressed gas, and some regulators are not interchangeable among cylinders.
- Do not use compressed gases to clean clothing or work surfaces.
- Inspect cylinders regularly for leaks using an approved leak detecting liquid. Never use a flame to detect a leak.
- Never mix gases in a cylinder. The next person who draws from it may unknowingly cause an explosion.

- Never heat a cylinder to raise the pressure of the gas (this can defeat the safety mechanisms provided by the manufacturer).
- Always place valve covers on cylinders when they are not in use, even if cylinders are empty.
- Turn off cylinder valves when leaving cylinders unattended, even for a short amount of time.
- Use the cylinder valve for turning gas off, not the regulator.
- All cylinders should be returned to an appropriate storage area when not in use and to the vendor when no longer needed.
- If the owner of a cylinder cannot be identified, contact the EHS for assistance.

G. DAMAGED CYLINDERS

- When a cylinder leak cannot be corrected by simply tightening the valve, connection, or regulator, the subsequent procedures should be followed:
 - Remove the cylinder to a well-ventilated location only if it is safe to do so. Refer to MSDS for safety and exposure information.
 - Evacuate the immediate area and notify the University Police by calling 911 from any university phone or (703) 993-2810.

H. GAS SPECIFIC REQUIREMENTS

- Do not open acetylene or other flammable gas cylinder valves more than ½ turn of the spindle, and preferably no more than ¾ of a turn. This reduces the risk of explosion and allows for the cylinder valve to be closed quickly in order to cut off the flow of gas.
- Do not use copper piping, fittings, or tubing on acetylene cylinders. An explosion may result.
- Do not use acetylene at operating pressures above 15 psi.
- Do not use cast iron pipes, fittings, and tubing for hydrogen or chlorine cylinders.
- Never use oxygen as a substitute for “compressed air” to run pneumatic tools, in oil heating burners, to start internal combustion engines, to purge distribution lines, or to create pressure for ventilation.

The information contained in this Guide is not inclusive of all OSHA regulations. Please contact Environmental Health and Safety Office at (703) 993-8448 or visit www.OSHA.gov for more information regarding workplace hazards, safety precautions, and regulations.