

G. Handling, Using, And Storing of Compressed Gas Cylinders

1. Handling Cylinders

- a. Only cylinders approved for use in interstate commerce for transportation of compressed gases shall be accepted.
- b. Numbers or marks stamped on cylinders shall not be removed or changed.
- c. Because of their shape, smooth surface, and weight, cylinders are difficult to carry by hand. Cylinders may be rolled on their bottom edge but never dragged. Cylinders weighing more than 40 pounds (18.2 kg total) shall be transported on a hand motorized truck and suitably secured to keep them from falling.
- d. Cylinders shall be protected from cuts or scratches.
- e. Compressed gas cylinders shall not be lifted with an electro- magnet. Where cylinders must be handled by a crane or derrick as on construction jobs, they shall be carried in a cradle or suitable platform and extreme care shall be taken to see that they are not dropped or bumped. Slings shall not be used.
- f. Cylinders shall not be dropped or be allowed to strike each other violently.
- g. Cylinders shall not be used for rollers, supports, or any purpose other than to contain gas.
- h. Safety devices in valves or on cylinders shall not be tampered with.
- i. When in doubt about the proper handling of a compressed gas cylinder or its contents, the supplier of the gas shall be consulted.
- j. When empty cylinders are to be returned to vendor, they shall be marked “Empty” or MT with chalk. Close the valves and replace the valve protection caps if the cylinders are designed to accept caps.
- k. Cylinders to be transported shall be loaded to allow as little movement as possible. Secure them to prevent violent contact or upsetting.
- l. Cylinders shall always be considered full and shall be handled carefully. Accidents have resulted when containers under partial pressure were thought to be empty.
- m. The fusible safety plugs on acetylene cylinders melt at about the boiling point of water. If an outlet becomes frozen or clogged with ice, it shall be thawed with warm (not boiling) water applied to the valve only. A flame shall never be used.

2. Using Cylinders

- a. Cylinders, particularly those containing liquefied gases and acetylene, shall be used in a secured upright position to prevent them from being accidentally knocked over.
- b. Unless the cylinder valve is protected by a recess in the head, the metal cap shall be kept in place to protect the valve when the cylinder is not connected for use. A blow on an unprotected valve might cause high pressure gas to escape.
- c. The threads on a regulator or union shall correspond to those on the cylinder valve outlet. Connections that do not fit shall not be forced.

- d. Cylinder valves shall be opened slowly. Cylinders without hand-wheel valves shall be opened with a spindle key, special wrench, or other tool provided or approved by the gas supplier.
- e. Cylinders of compressed gas shall not be used without a pressure-reducing regulator attached to the cylinder valve except where cylinders are attached to a manifold—in which case the regulator shall be attached to the manifold header.
- f. Before making connection to a cylinder valve outlet, the valve shall be “cracked” for an instant to clear the opening of particles of dust or dirt. The valve and opening shall always be pointed away from the body and not toward anyone else. Fuel gas cylinder valves shall not be cracked near other welding work, sparks, open flames, or other possible sources of ignition.
- g. Regulators and pressure gauges shall be used only with gases for which they are designed and intended. Make no attempt to repair or alter cylinders, valves, or attachments. This shall be done by the manufacturer.
- h. Unless the cylinder valve has first been closed tightly, no attempt shall be made to stop a leak between the cylinder and the regulator by tightening the union nut.
- i. Fuel gas cylinders in which leaks occur shall be taken out of use immediately and handled as follows:
 - i. The valve shall be closed and the cylinder taken outdoors well away from any ignition source. The cylinder shall be properly tagged and the supplier notified.
 - ii. A regulator attached to the valve may be used temporarily to stop a leak through the valve seat.
 - iii. If the leak occurs at a fuse plug or other safety device, the cylinder shall be taken outdoors well away from any ignition source, the cylinder valve opened slightly, and permit the fuel gas permitted to escape slowly. The cylinder shall be plainly tagged. “No Smoking” or “Ignition Source” signs shall be “Posted”. A responsible person shall stay in the area until the cylinder is depressurized to make sure that no fire occurs. The supplier shall be promptly notified and follow his instructions for returning the cylinder.
- j. Sparks, molten metal, electric currents, excessive heat, or flames shall not be permitted to come in contact with the cylinder or attachments.
- k. Oil or grease shall never be used as a lubricant on valves or attachments of oxygen cylinders. Oxygen cylinders and fittings shall be kept away from oil and grease such cylinders or apparatus shall not be handled with oily hands, gloves, or clothing.
- l. Never use oxygen as a substitute for compressed air in pneumatic tools, in oil pre-heating burners, to start internal combustion engines, or to dust clothing. It shall be used only for the purpose for which it is intended.
- m. Cylinders shall never be brought into tanks or unventilated rooms or other closed quarters.
- n. Cylinders shall not be filled except with the consent of the owner and then only in accordance with DOT (or other applicable regulations. No attempt to mix gases in a compressed gas cylinder or to use it for purposes other than those intended by the supplier shall be made.

- o. Before a regulator is removed from a cylinder valve, the cylinder valve shall be closed and the gas released from the regulator.

3. Storing Cylinders

- a. Cylinders shall be stored in a safe, dry, well-ventilated place prepared and reserved for the purpose.
- b. Cylinders shall not be stored near elevators, gangways, stairwells, or other places where they can be knocked down or damaged.
- c. Oxygen cylinders shall not be stored within 20' (6m) of gas cylinders or highly combustible materials. If closer, cylinders shall be separated by a fire-resistive partition at least 5' (1.6 m) having a fire resistive rating of at least ½ hour.
- d. Acetylene and liquefied fuel gas cylinders shall be stored with the valve end up. If storage areas are within 100' (30.5 m) distance of each other and not protected by automatic sprinklers, the total capacity of acetylene cylinders stored and used inside the building shall be limited to 2000 ft³ (57 m³) of gas, exclusive of cylinders in use or connected for use. Quantities exceeding this total shall be stored in a special room built in accordance with the specifications of NFPA 51, "Oxygen-Fuel Gas Systems for Welding and Cutting," either in a separate building or outdoors.
- e. Acetylene storage rooms and buildings shall be well ventilated. Open flames shall be prohibited. Storage rooms shall have no other occupancy.
- f. Cylinders shall be stored on a level, fire resistive floor
- g. To prevent rusting, cylinders stored in the open shall be protected from contact with the ground and against weather extremes such as ice and snow accumulations in winter and continuous direct rays of the sun in the summer.
- h. Cylinders are not designed for temperatures in excess of 130F (54C). Accordingly, they shall not be stored near sources of heat such as radiators or furnaces, or near highly flammable substances like gasoline, oil or volatile liquids.
- i. Cylinder storage shall be planned so that cylinders will be used in the order in which they are received from the supplier.
- j. Empty and full cylinders shall be stored separately with empty cylinders plainly identified as such so as to avoid confusion. Cylinders having held the same contents shall be grouped together.
- k. A flame or electric arc shall never be permitted to contact any part of a compressed gas cylinder.
- l. Storage rooms for cylinders containing flammable gases shall be well ventilated to prevent the accumulation of explosive concentrations of gas; no source of ignition shall be permitted; smoking shall be prohibited; wiring shall be in conduit; electric lights shall be in fixed position, enclosed in glass or other transparent material to prevent gas from contacting lighted sockets or lamps, and they shall be equipped with guards to prevent breakage; electric switches shall be located outside the room.