

Monthly Safety Notice

May 2020

National Baromedical Services, Inc.

Gas Cylinder Safety Reminders

Background

The medical air cylinders were nearly empty and so replacements were requested from the engineering department. This is routine procedure that has occurred in the hyperbaric medicine department for nearly 40 years. The engineer gently delivered and secured two full yellow "air" cylinders in the gas closet. The hyperbaric staff member went to change out the empty cylinders for the full cylinders and reattach the hoses. At this point, it was discovered that the cylinder valve prevented the hose from being connected properly. The staff member then read the cylinder label more closely to note that the 'medical air-looking' label was not actually medical air at all but rather a different mix of gases.

(Empty) Medical Air USP



(Full) Compressed Gas NOS



Outlet Valve too Small for Medical Air Hose Connection



Note the Grey Painted Cylinder Collar



The Issue

IDENTIFICATION

1. The contents of any compressed gas cylinder must be clearly identified. Such identification should be stenciled or stamped on the cylinder or a label.
2. No compressed gas cylinder should be accepted for use that does not legibly identify its contents by name. If the labeling on a cylinder becomes unclear or an attached tag is defaced to the point the contents cannot be identified, the cylinder should be marked "contents unknown" and returned directly to the manufacturer.
3. Never rely on the color of the cylinder for identification. Color-coding is not reliable because cylinder colors may vary with the supplier. Additionally, labels on caps have little value because caps are interchangeable. Always read the cylinder label!
4. The labels should be color coded to distinguish hazardous gases (such as flammable, toxic, or corrosive substances) (e.g., a yellow background and black letters).
5. Signs should be conspicuously posted in areas where flammable compressed gases are stored, identifying the substances and appropriate precautions (e.g., HYDROGEN - FLAMMABLE GAS - NO SMOKING - NO OPEN FLAMES). NOTE: OXYGEN IS NON-FLAMMABLE.

HANDLING AND USE

1. Gas cylinders must be secured at all times to prevent tipping.
2. Cylinders may be attached to a bench top, individually to the wall, placed in a holding cage, or have a non-tip base attached. Chains or sturdy straps may be used to secure them.
3. If a leaking cylinder is discovered, move it to a safe place (if it is safe to do so) and inform the Environmental Health & Safety Department. You should also call the vendor as soon as possible. Under no circumstances should any attempt be made to repair a cylinder or valve.
4. Standard cylinder-valve outlet connections have been devised by the Compressed Gas Association (CGA) to prevent mixing of incompatible gases. The outlet threads used vary in diameter; some are internal, some are external; some are right-handed, some are left-handed. In general, right-handed threads are used for non-fuel and water-pumped gases, while left-handed threads are used for fuel and oil-pump gases.
5. To minimize undesirable connections, only CGA standard combinations of valves and fittings should be used in compressed gas installations; the assembly of miscellaneous parts should be avoided. The threads on cylinder valves, regulators and other fittings should be examined to ensure they correspond and are undamaged.
6. Cylinders should be placed with the valve accessible at all times. The main cylinder valve should be closed as soon as it is no longer necessary that it be open (i.e., it should never be left open when the equipment is unattended or not operating). This is necessary not only for safety when the cylinder is under pressure, but also to prevent the corrosion and

contamination resulting from diffusion of air and moisture into the cylinder after it has been emptied.

7. Cylinders are equipped with either a hand wheel or stem valve. For cylinders equipped with a stem valve, the valve spindle key should remain on the stem while the cylinder is in service. Only wrenches or tools provided by the cylinder supplier should be used to open or close a valve. At no time should pliers be used to open a cylinder valve. Some valves may require washers; this should be checked before the regulator is fitted.
8. Cylinder valves should be opened slowly. Oxygen cylinder valves should be opened all the way. Open up the oxygen cylinder valve stem just a crack. Once the needle on the high-pressure gauge has stopped, open up the valve all the way. This back seats the valve. Oxygen cylinders must have the valve opened up all the way because of the high pressure in the cylinder. There is a back-seating valve on the oxygen cylinder. This prevents the high-pressure gas from leaking out through the threaded stem.
9. Oxygen cylinders, full or empty, shall not be stored in the same vicinity as flammable gases. The proper storage for oxygen cylinders requires that a minimum of 20 feet be maintained between flammable gas cylinders and oxygen cylinders or the storage areas be separated, at a minimum, by a firewall five feet high with a fire rating of 0.5 hours. Greasy and oily materials shall never be stored around oxygen; nor should oil or grease be applied to fittings.
10. Regulators are gas specific and not necessarily interchangeable! Always make sure that the regulator and valve fittings are compatible.
11. After the regulator is attached, the cylinder valve should be opened just enough to indicate pressure on the regulator gauge (no more than one full turn) and all the connections can be checked with a soap solution for leaks. Never use oil or grease on the regulator of a cylinder valve.
12. If there is any question as to the suitability of a regulator for a particular gas, check with the Engineering Department or call your vendor for advice.
13. When the cylinder needs to be removed or is empty, all valves shall be closed, the system bled, and the regulator removed. The valve cap shall be replaced, the cylinder clearly marked as "empty," and returned to a storage area for pickup by the supplier. Empty and full cylinders should be stored in separate areas.

TRANSPORTATION

1. The cylinders that contain compressed gases are primarily shipping containers and should not be subjected to rough handling or abuse. Such misuse can seriously weaken the cylinder and render it unfit for further use or transform it into a rocket having sufficient thrust to drive it through masonry walls.
2. To protect the valve during transportation, the cover cap should be screwed on hand tight and remain on until the cylinder is in place and ready for use.
3. Cylinders should never be rolled or dragged. When moving large cylinders, they should be strapped to a properly designed wheeled cart to ensure stability.
4. Only one cylinder should be handled (moved) at a time.

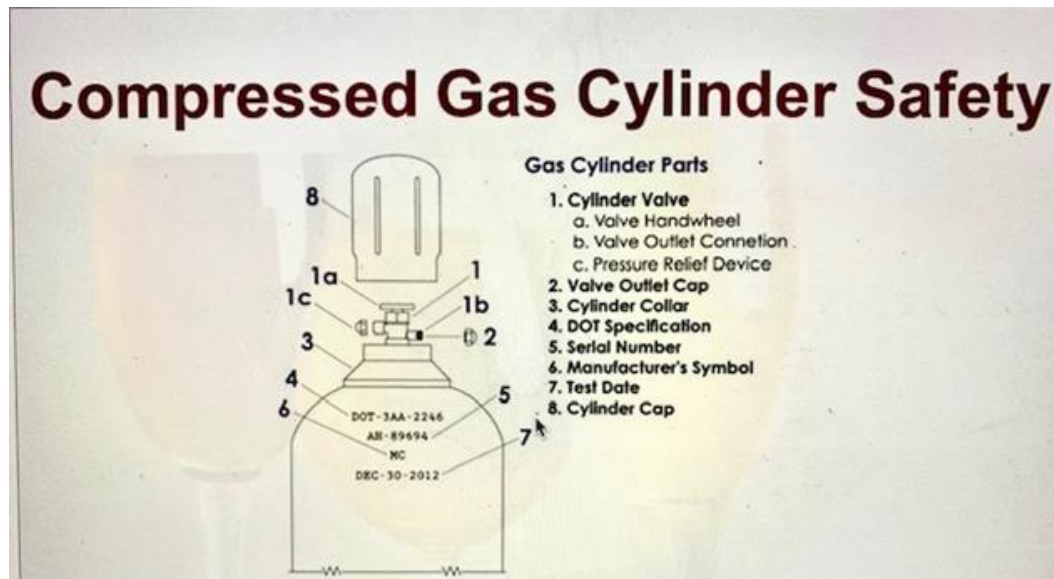
Bottom Line

Compressed gases present a unique hazard. Depending on the particular gas, there is a potential for simultaneous exposure to both mechanical and chemical hazards.

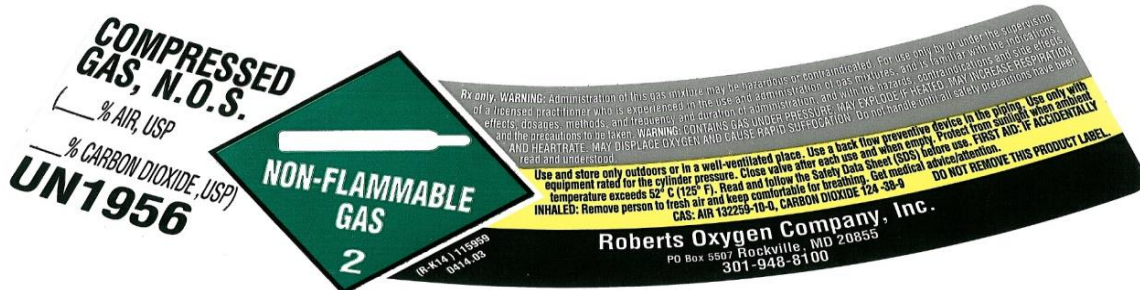
Gases may be:

- Flammable or combustible
- Explosive
- Corrosive
- Poisonous
- Inert
- or a combination of hazards

Careful procedures are necessary for handling the various compressed gases, the cylinders containing the compressed gases, regulators or valves used to control gas flow, and the piping used to confine gases during flow.



“EXAMPLES OF LABELS THAT MAY SHOW UP ON CYLINDERS IN YOUR FACILITY”



Watch this You Tube video to watch what happens if a cylinder is not handled carefully and the valve gets broken.

<https://youtu.be/C4kb-8CjVYg>