Compressed Gas Cylinder Hazards

We use compressed gases for a variety of tasks at the University. You will find compressed gases and the cylinders that house them in laboratories, clinical areas, for welding, powering industrial trucks and a variety of less common tasks.

Compressed gases are necessary and serve a variety of purposes. If not treated correctly, however, they can pose serious hazards. They can present chemical hazards and the cylinders themselves could present a physical hazard.

Chemical Hazards
Compressed gases can be toxic, flammable, oxidizing, corrosive or inert. In the event of a leak, inert gases such as nitrogen or helium can quickly displace air in a large area creating an oxygen-deficient atmosphere. Toxic gases (e.g. carbon monoxide, ammonia) can create poisonous atmospheres. Flammable, oxidizing or reactive gases such as acetylene, ethylene and vinyl chloride can result in fire and exploding cylinders.

Physical Hazards
All compressed gas cylinders are hazardous because of the high pressures inside the gas cylinders. Cylinders can become damaged from falling, heat, electric circuits, motion, vibration or anything that can cause a weakness or crack in the cylinder wall or shell. There have been many cases in which damaged cylinders have ruptured, exploding sharp metal pieces throughout the area.

The most common hazard associated with cylinders occurs when cylinders tip or fall over. Falling cylinders have broken bones and caused multiple contusions at the University. Far more dangerous, falling cylinders have been known to become missile-like projectiles, causing severe injury and damage. This danger can happen when unsecured cylinders are knocked over causing the cylinder valve to break and high pressure gas to escape rapidly.

Safe handling of compressed gas cylinders is not complicated but is extremely important. Safety measures include:

- Store cylinders with their cylinder valves in the closed position;
- Securely attach cylinder valve caps when the cylinder is not in use, is stored, or being moved;
- Transport cylinders securely on a cart designed for cylinder use;
- Secure all cylinders during transport;
- Turn all cylinder valves off;
- Separate cylinders according to their contents. Place oxygen cylinders at least 20 feet from any flammable gas cylinders or combustible materials; or by a noncombustible barrier at least five-feet high and with a fire-resistant rating of at least 30 minutes;
- Identify empty cylinders, and store empty cylinders separate from full cylinders;
- Secure all cylinders in an upright position while in storage and in use;
- Ventilate all cylinder storage areas;
- Keep cylinder storage away from fire and potential electrical hazards;
- Ensure all cylinders are labeled to identify their contents. Do not trust the cylinder color code as identification method for cylinder content (Medical gas cylinders are to be color coded, but check the label to be certain.);
- Return any cylinder to the supplier if the label does not identify contents;
- Avoid dropping or striking cylinders.
- Never use cylinders' as rollers or supports for other equipment;
- Roll cylinders on their bottom edge when moving them short distances.
- Inspect all cylinders, valves, regulators, hoses, torches and other equipment prior to use;
- Position the cylinder valve end up when in use;
• Place cylinders away from burning and cutting operations, or other ignition sources such as heat
generating or sparking or arching devices;
• Vent the cylinder by slightly opening (cracking) valve prior to attaching a regulator or any hoses or
piping. Avoid being in front of the valve opening when this is done;
• Use the proper regulator for the cylinder to reduce pressure;
• Ensure that all connectors are free of oil and grease;
• Ensure that fuel gas and oxygen hoses are easily distinguishable. All other lines are to be
identifiable;
• Open all valves slowly;
• Use a friction lighter to ignite a flammable gas;
• Upon completion, close all valves;
• Close cylinder valves tightly;
• Close needle valves finger tight to avoid damage to valve and/or valve stem;
• Do not used compressed air to blow dirt or debris from your clothing

**Compressed Gas Cylinder Safety Training**

Compressed gas safety training is mandatory for all UR employees who handle compressed gas
cylinders. This training may come in a variety of forms (live, on-line, video, hard copy). Completion of the
training must be documented; this documentation must be maintained either in HRMS or within the
department. Every department manager is responsible for identifying employees who handle
compressed gas cylinders and ensuring that applicable safety training is received. You may contact the
Department of Environmental Health and Safety at 275-3241 with questions.

*Remember – the greatest physical hazard represented by the compressed gas cylinder is the
tremendous force that may be released if it is knocked over!
Keep compressed gas cylinders secured*

The Occupational Safety Unit of EH&S is available to offer more guidance regarding compressed gases
and cylinders or to answer your questions. We can be reached at 275-3241 or visit our website at
www.safety.rochester.edu