**Guidelines for Safe Storage of Compressed Gas**

**Compressed Gases**

Widely used in laboratories, they are often taken for granted but they do represent a significant risk potential. This page highlights the risks and lists the corresponding precautions to be taken.

**General Considerations**

Compressed gases present three potential safety issues.

The first two issues are pressure and volume. A third issue is the nature of the contained gas. Fuels burn. Oxygen supports combustion. Other gases have special characteristics.

The primary safety rule for handling compressed gases is:

An empty cylinder is never out of gas. The same handling rules apply to it that apply to a full cylinder of the same gas. If the gauge reads zero and the cylinder is at sea level, the cylinder still contains gas at 14.7 psi absolute pressure.

**General Handling Rules**

* Always secure gas cylinders upright to a wall, cylinder rack or post. When the protective cap has been removed, each cylinder must be individually secured.
* Always replace the cylinder cap when the cylinder is not in use or when it is being moved. If the valve of a high-pressure gas cylinder is accidentally broken off, the contents of the cylinder will jet from a hole about the diameter of a pencil. The escaping gas could have enough thrust to turn the cylinder into a rocket, depending on the cylinder's size and weight.
* Always use an approved cart when moving a cylinder. Never drag a cylinder along the floor. For short (a few feet) moves tilt the cylinder and roll it on its bottom edge.
* If a valve will not open by hand contact the cylinder distributor. Never hammer, or pry a stuck or frozen cylinder valve to loosen it, and never use a wrench.
* Do not allow grease, oil or other combustibles to come in contact with valve threads. This is particularly important when dealing with oxidizing gases.
* Never use a gas cylinder unless the contents are clearly identified with a supplier label.
* Do not rely on the colour of the cylinder to identify the gas inside.
* Never ground a cylinder or place it near an electrical conductor, including plumbing.
* Do not transfill gas from one cylinder to another.

**Valves and Regulators**

* Always use the proper regulator for the gas in the cylinder. Gas regulators reduce the pressure inside the cylinder to a safe level for use. They are designed for use with specific gases, within prescribed pressure ranges. Different gases have different densities. The spring inside the regulator is designed to provide the correct flow rate for a particular kind of gas. In addition, using the wrong regulator may cause some gases to react with the materials inside the regulator.
  + For example, materials used in some regulators are not designed for oxygen and will ignite if used for oxygen. Plaques or decals on the regulator may indicate which gas the regulator is designed for. Cylinder valve connections on regulators are also designed to minimize the chances of using the wrong regulator. Always verify that you have the correct regulator for your application.
* Always check the regulator before attaching it to a cylinder. If the connections do not fit together readily, the wrong regulator is being used. Damaged threads on the connecting nut or valve outlet can also make a regulator difficult to attach and likely to leak.

When attaching a regulator to a cylinder certain procedures should be followed in a specific sequence. Refer to the manufacturer's specifications when in doubt. The following is a general outline (specific situations may require a different sequence):

* With all gases, wipe the outlet with a clean, dry, lint free cloth. The threads and mating surfaces of the regulator and hose connections should also be cleaned before the regulator is attached.
* Always use a cylinder wrench or other tightly fitting wrench to tighten the regulator nut and hose connections. Using an oversized wrench, adjustable wrench, pliers or a pipe wrench may damage the fittings and make it impossible to tighten them properly. A connection problem caused by dirty or damaged threads will result in leaks when the cylinder is used.
* Attach the regulator securely and ensure the valve on the regulator's pressure gauge is cracked slightly before opening the main cylinder valve. This will ensure that the regulator's diaphragm seats properly once the main cylinder valve is opened.
* When opening the main cylinder valve stand to the side away from the regulator, crack the valve open slightly at first, to verify that the regulator's diaphragm is working, before opening the valve wide. Note: cylinder regulators have a relief device to prevent excessive pressure from developing. High- pressure cylinder regulator gauges have solid-front, safety-back construction. When subject to excessively high pressure, the light-metal safety back will blow off to relieve the pressure.
* Check with 'snoop' for leaks.

**Cylinder Storage**

* Store all cylinders in a designated area. Avoid storage near exits.
* Store and use cylinders on a first-in, first-out basis.
* Never remove identifying labels
* Chalk 'MT' or 'empty' on all empty cylinders.
* Keep fuel gas cylinders away from oxygen cylinders.
* Never store any gas cylinder where the temperature may rise above 54°C.
* Never move a gas cylinder when the regulator is in place. Place safety caps on cylinders that are being stored or moved.
* Never try to refill cylinders, to mix gases in a cylinder or to transfill gas from one cylinder to another.
* If a cylinder develops a leak or the main valve sticks open, evacuate the area. Then call Security at ext. 4444.