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Guidance Document

Compressed Gases

[This is a brief and general summary. Read the full MSDS for more details before handling.]

Introduction: Compressed gases pose physical hazards from the contents under pressure and heavy, awkward cylinders themselves. Remember that chemical hazards may also be present. Some gases are toxic, flammable, pyrophoric, or corrosive. Liquefied compressed gases (cryogenic liquids) are discussed elsewhere. Become familiar with all the hazards by reading the MSDS for each type of gas being used.

High Pressure: All cylinders of compressed gases are hazardous because of the high pressure stored inside. A sudden release of pressure can cause injury from the escaping gas, a propelled cylinder or other objects nearby.

Asphyxiation: Simple asphyxiation is the primary hazard with inert gases. Being odorless and colorless, they can escape undetected to reduce oxygen concentration below life-sustaining level.

Fire and Explosion: Fire and explosion are the primary hazards associated with flammable gases, oxygen and other oxidizing gases. Flammable gases can be ignited by heat, flame, hot object or static electricity. Oxygen by itself does not burn, but it will support or accelerate combustion of flammable materials. Some materials that are nonflammable under normal conditions may burn if oxygen is enriched.

Chemical Burns: Corrosive gases can chemically attack various materials including some fire resistant clothing. Some gases are more corrosive in the presence of water. Corrosive gases can cause rapid destruction of skin and other tissues.

Chemical Poisoning: Poisoning is the primary hazard with toxic gases. Very small concentrations of some toxic gases can cause serious poisoning. Some symptoms of exposure may be delayed.

Cold "Burns": Rapidly escaping gas from a cylinder can cause destruction freezing of tissues.

Weight of the Cylinder: A full size cylinder may weigh 150 lb or more. Moving such a mass manually may injure your back or muscles. Dropping or dragging a cylinder could cause serious injury.

Use Guidelines

1. Use the appropriate regulator. Regulators are specific to the gas involved. Do not attempt to adapt or modify a regulator to make it fit a cylinder. Regulators are designed to fit specific cylinder valves to prevent improper use. Contact department technician, the gas supplier or EHS with any questions.
2. Attach the closed regulator to the cylinder. Do not open the main cylinder valve unless the regulator is completely closed.
3. When possible use flammable and reactive gases in a fume hood. Certain gases (highly toxic, pyrophoric) must always be stored and used in a special enclosure. Contact EHS for more information.
4. Frequently inspect regulators, relief devices, valves, connections, transfer hoses and lines for damage.
5. Never use a cylinder that cannot be identified. Always read the label on the cylinder. Do not rely on color to identify the contents.
6. Do not use oil or grease on any component of an oxidizing gas because fire or explosion could result.
7. Do not transfer gases from one cylinder to another.
8. Locate cylinders so that the main valve is always accessible.
9. Close the main cylinder valve and release regulator pressure whenever the cylinder is not in use.
10. Remove regulators from cylinders that are not in use. Attach the safety cap to protect the valve.

Storage Guidelines

1. Secure cylinders with chain or strap, empty or full, to a wall, bench or other fixed support. Cylinders should be secured individually.
2. Store oxygen and other oxidizing gases away from flammable and combustible materials.
3. Keep the number of cylinders in a lab to a minimum to reduce fire and toxicity hazard and to comply with building code requirements.
4. To transport a cylinder, close valve, remove regulator, attach safety cap. Strap or chain the cylinder to a cylinder cart. Do not drop, roll, drag or slide a cylinder.
5. Mark empty cylinder and return to storage are for pickup by the vendor. Store empties separate from full cylinders.
6. Use only wrenches or other tools supplied by the cylinder supplier to open a valve. Open valves slowly.

Lecture Bottles

- Do not buy lecture bottles from vendors who do not have a return policy.
- If this is not possible, plan to use all of the contents in a practical time frame.
- Do not store unneeded lecture bottles for some possible future use. Submit to EHS for disposal. Old lecture bottles pose a significant hazard to lab personnel and equipment.
- Follow all safety recommendations of the supplier.
- Use only recommended valving, regulators, transfer tubing.
- Never refill a lecture bottle.
- When the lecture bottle is empty, mark it as such with an indelible marker. Keep in mind that some bottles are still hazardous when “empty.” Submit empties to EHS for disposal.