**Compressed Gases Guidance**

The following information is intended to provide general guidance on how to safely work with a specific class of chemical or hazard. This information is generic in nature. It addresses the use and handling of substances by hazard class only.

Additional requirements may apply if the materials are a highly toxic compressed gas. Please refer to the Hazardous and Highly Toxic Gases Guidance document if applicable.

**Labeling Compressed Gas Cylinders**

Gas cylinders must be labeled as to their contents. Compressed gas cylinders should not be received from the vendor if they are not properly labeled. It is the responsibility of the principal investigator/course director to re-label the compressed gas cylinder if the label is fading, deteriorating or not fully legible.

**Securing of gas cylinders**

Cylinders of compressed gases must be handled as high energy sources. They pose a serious hazard if the cylinder valve is dislodged. When storing or moving a cylinder, have the cap securely in place to protect the stem. Use suitable racks, straps, chains or stands to support cylinders.

Do not store cylinders or lecture bottles with the regulator in place. If the regulator fails, the entire contents of the gas cylinder may be discharged.

**Decontamination procedures**

Not Applicable

**Designated area**

Compressed gas cylinders which contain acutely toxic gases must be stored in a designated area. See the Hazardous and Highly Toxic Compressed Gases Guidance document.

**Emergency procedure**

Emergency procedures which address response actions to fires, explosions, spills, injury to staff, should be developed by each laboratory. The procedures should address as a minimum the following:

* **Who to contact:** (University police, Principal investigator/course director of the laboratory including evening phone number and Office of Environmental Health Safety)
* The location of all safety equipment (showers, eye wash, fire extinguishers, etc.)
* The method used to alert personnel in nearby areas of potential hazards
* Special first aid treatment required by the type of compressed gas handled in the laboratory

**Fume hood**

Manipulation of compressed gases should typically be carried out in a fume hood if the compressed gas is an irritant, oxidizer, asphyxiant or has other hazardous properties.

 **Glove (dry) box**

Not applicable

**Gloves**

Not applicable

**Hazard assessment**

Hazard assessment for work with compressed gases should assure that all staff understand proper use and handling precautions; that all pressurized equipment is properly shielded; regulators are not interchanged between different gas types; all hose connections are properly secured and are appropriate for the pressure(s) used.

**Protective apparel**

Lab coats, closed toed shoes and long sleeved clothing should be worn when handling compressed gases.

The Principal Investigator/course director is responsible to the select the appropriate PPE. The Office of Environmental Health and Safety is available to provide guidance.

**Eye protection**

Eye protection in the form of safety glasses must be worn at all times when handling compressed gases. Ordinary (street) prescription glasses do not provide adequate protection. (Contrary to popular opinion these glasses cannot pass the rigorous test for industrial safety glasses.) Adequate safety glasses must meet the requirements of the Practice for Occupational and Educational Eye and Face Protection (ANSI/ISEA Z87.1-2010) and must be equipped with side shields.

The Principal Investigator/course director is responsible to the select the appropriate PPE.

The Office of Environmental Health and Safety is available to provide guidance.

**Gloves**

Not applicable

**Safety shielding**

Safety shielding is required any time there is a risk of explosion, splash hazard or a highly exothermic reaction. All manipulations of compressed gases which pose this risk should occur in a fume hood with the sash in the lowest feasible position. Portable shields, which provide protection to all laboratory occupants are acceptable.

The Principal Investigator/course director is responsible to the select the appropriate shielding.

The Office of Environmental Health and Safety is available to provide guidance.

**Eyewash**

Suitable facilities for quick drenching or flushing of the eyes and body shall be provided within the work area for immediate emergency use. Bottle type eyewash stations are not acceptable.

**Safety shower**

A safety or drench shower should be available in a nearby location where the carcinogens are used.

**Signs and labels**

**Containers:** All compressed gases must be clearly labeled with the correct chemical name. Handwritten labels are acceptable; chemical formulas and structural formulas are not acceptable. The compressed gas cylinder should be labeled to indicate if the container is full or empty.

**Special storage**

Cylinders shall be stored in an upright position and secured to a wall, floor or laboratory bench through the use of appropriate cylinder supports.  When using commercial cylinder supports, do not secure more cylinders than the support was designed for.  It is preferable that cylinder supports be purchased from Rowan University-approved compressed gas or scientific supply vendors.  Cylinder supports installed by Facilities secured to the wall at two and four feet above the floor using fasteners appropriate for the wall construction and weight of cylinders to be secured.  Each shall have a section of chain that securely attaches to the strut at two points.  When the chain is attached to the strut it must fit snuggly around the cylinders.

Cylinder caps should remain on the cylinder at all times unless a regulator is in place. Cylinders should be stored in areas where they will not become overheated and overcrowded. Avoid storage near radiators, areas in direct sunlight, steam pipes and heat releasing equipment such as sterilizers.

Transport compressed gas cylinders on equipment designed for this function. Never carry or "walk" cylinders by hand. They must be transported on chain-equipped hand trucks or carts. Never roll or drag cylinders.

**Special ventilation**

Manipulation of compressed gas that is an irritant, oxidizer, asphyxiant, or has other hazardous properties outside of a fume hood may require special ventilation controls in order to minimize exposure to the material. Fume hoods provide the best protection against exposure to compressed gases in the laboratory and are the preferred ventilation control device. If you have questions contact the Office of Environmental Health and Safety to review the adequacy of all special ventilation.

**Leak response**

In the event of a leak of a compressed gas that is an irritant, oxidizer, asphyxiant, or has other hazardous properties all personnel in the area should be alerted. Vacate the laboratory immediately and call for assistance.

* University Police 856-256-4911. This is a 24 hour service.
* Office of Environmental Health Safety, 856-256-5105 or EHS@Rowan.edu.

Remain on the scene, but at a safe distance, to receive and direct safety personnel when they arrive.

**Vacuum protection**

Not applicable

**Waste disposal**

All empty or partially filled compressed gas cylinders should be returned to the supplier. If the supplier does not accept empty or partially filled cylinders, contact the Office of Environmental Health and Safety concerning disposal at 856-256-5105 or EHS@Rowan.edu.