








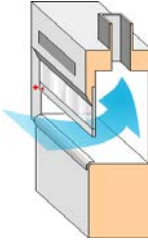


Guidelines for Safe Use of COMPRESSED GASES

Examples: Nitrogen, Argon, Compressed Air, Oxygen, Hydrogen, Methane, Acetylene, Carbon Dioxide

Possibly also



or

Hazard Controls	Hazards	<ul style="list-style-type: none"> The large amount of pressure contained makes gas cylinders a potential rocket or bomb if the cylinder or valve fails. See Safety Data Sheet (SDS) for specific hazard information. <i>A lab-specific SOP is needed for particularly hazardous gases, such as carbon monoxide or chlorine. PI or OESO approval of lab SOPs is required for high risk gases, such as nitric oxide.</i>
	Selection & Purchase	<ul style="list-style-type: none"> Purchase the smallest cylinders at the lowest concentration practical. Order gas cylinders with a restrictive flow orifice to limit gas flow rate leaving the cylinder. Order with pressure relief device to allow safe venting if excessive pressure develops.
	Storage & Transportation	<ul style="list-style-type: none"> Store upright and secure with sturdy chains or straps (between midpoint & "shoulder") to a wall, or use a cylinder rack, bench mount, or stand. Keep valves closed (with valve covers on) when not in use. Store separately: <ul style="list-style-type: none"> Full away from empty cylinders. (Label as full or empty.) Oxidizing gases  (such as oxygen) away from flammable gases.  Post storage area for flammable gases or oxygen with "No Smoking" and "No Open Flames" signs.  Do not store near flammable materials. Do not store above 125°F or in direct sunlight, or outside of the temperature range specified by the manufacturer. Do not store in cold rooms or other unventilated areas (unless content is compressed air) without OESO permission. Transport with valve cover on using a cylinder dolly. Secure cylinder during transport. Use a helper if possible. 
	Engineering Controls	<ul style="list-style-type: none"> For flammable gases, use a flashback arrestor between regulator and hose. (Prevents flame from entering cylinder.) Consider a ventilated gas cabinet or chemical fume hood for flammable or irritating gases, depending on quantities used.  Use a regulator compatible with the specific compressed gas being used. 
	Work Practice Controls	<ul style="list-style-type: none"> Duke employees will not refill, modify, tamper with, paint, deface, obstruct, remove or repair any part of the cylinder. Open flammable gases a maximum of 1.5 turns (so it's easier to close valve quickly if needed).
Personal Protective Equipment	<ul style="list-style-type: none"> Minimum PPE: safety glasses.  <i>Wear closed-toed shoes when moving cylinders.</i>  	
Other	Emergencies	See Emergency Response Flip Chart and/or lab specific chemical hygiene plan. (If flammable gas is leaking, turn off ignition sources, evacuate the area, and call Duke Police.)
	Waste	Return cylinders and unused gas to vendor. If vendor cannot be determined, contact OESO.
	Training	Sign signature page in lab-specific plan to indicate review.
	Questions	Contact Laboratory Safety at 919-684-8822.