

## STANDARD OPERATING PROCEDURE

### Working with Compressed Gases

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Minimum Personal Protective Equipment Required: Eye protection

Risks: Explosion, release of toxic gases and/or asphyxiation if gas is rapidly released, frostbite from liquified gases.

Special Handling:

- ✓ Store gas cylinders in a well-ventilated area, secured and in an upright position.
- ✓ Segregate flammable and oxidizer cylinders
- ✓ NEVER lift a compressed gas cylinder by the cap or regulator

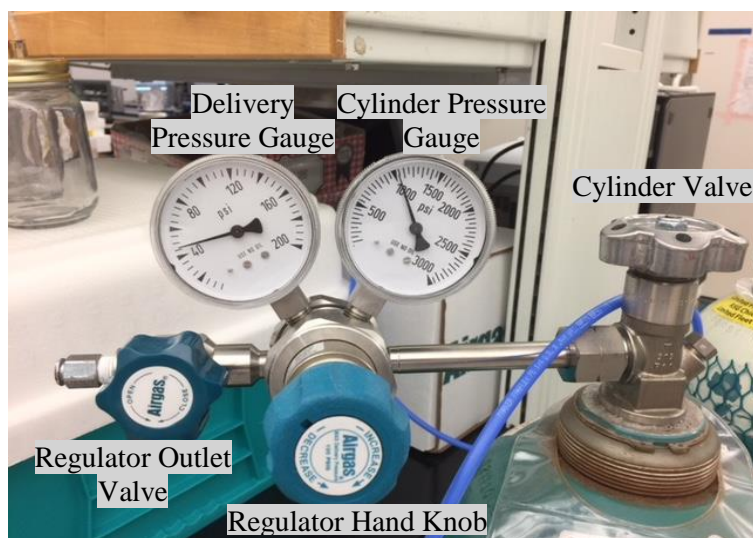
Transport and Storage:

- Use a wheeled cart (available in the storeroom) to transport cylinders to and from the lab
- Do not ride with the cylinder in the elevator
  - Place the cylinder (on the cart) into the elevator and press the floor button
  - Leave the elevator before the doors shut and use the stairs
  - Retrieve the cylinder from the elevator
- Cylinders must be secured in a cylinder rack with the chain on.
- If the cylinder is not connected to a regulator the cap should be on the cylinder
- Only use gas cylinders with a regulator.
- Always keep cylinder valves closed when not in use or if cylinder is empty.

Regulators:

- Each regulator and cylinder are equipped with a Compressed Gas Association (CGA) fitting and a corresponding CGA number. The number is imprinted on the metal and indicates what types of gases can be used with that regulator (or the type of regular needed). The CGA numbers on the cylinder and regulator should match.





### Connecting a Regulator\*:

1. Close the regulator by rotating the hand knob in a counterclockwise direction.
2. Close the regulator outlet valve by rotating the valve knob in a clockwise direction.
3. Connect the regulator to the cylinder without forcing the threads. If the inlet of the regulator does not fit the cylinder outlet, it is likely that the regulator is not intended for the gas service.
4. Slowly open the gas cylinder valve. Check the inlet pressure gauge to ensure that it registers the expected value. Low cylinder pressure may indicate a leaking valve.
5. Check all high-pressure connections for leaks using an approved soap solution or leak detection device.
6. Open the cylinder valve completely.
7. Adjust the regulator hand knob to raise the delivery pressure to the desired value. Do not exceed the maximum delivery pressure indicated by the model number label on the regulator.
8. Open the outlet valve on the regulator to establish gas flow to the system. The regulator itself should not be used as a flow controller by adjusting the pressure to obtain different flow rates.
9. After flow is established, the set delivery pressure may decrease slightly. Check to see that the delivery pressure is as desired and make any necessary adjustments.

### Removing a Regulator\*:

1. Shut off the gas cylinder valve completely.
2. Shut down any additional gas supplies that may be supplying gas to the system.
3. Open the regulator and the outlet valve to drain the contents of the regulator through the system in use. Both regulator gauges should descend to zero.
4. Close the regulator by rotating the hand knob counterclockwise. Close the outlet valve by rotating the valve knob clockwise.
5. Disconnect the regulator from the system or downstream equipment.
6. Disassemble the regulator from the cylinder by slowly loosening the cylinder connection. Listen for gas seepage. If leakage is evident, re-tighten the cylinder connection immediately, and check the cylinder valve for proper closure. If leakage occurs when the cylinder valve is closed, and the regulator has been drained of all gases, contact the gas supplier immediately.
7. Replace the cap on the cylinder over the valve.
8. Store the regulator or place it on a new cylinder.

\*Instructions taken from Matheson Guide to Regulators