

Compressed Gas Cylinder Exchange	Identifier:	CSP-0016
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1. INTRODUCTION

This procedure guides the moving and usage of compressed gas cylinders in the ISU Chemistry Department. Compressed gasses, such as nitrogen or oxygen, are stored in large metal cylinders under great pressure which can be hazardous if care is not taken in their storage and usage both physically and chemically.

2. PRECAUTIONS AND LIMITATIONS

- 2.1. Safety glasses must be worn while attaching and detaching regulators from compressed gas cylinders.
- 2.2. Gas cylinders must be appropriately secured while being used, moved, and stored.
- 2.3. Move compressed gas cylinders using an appropriate gas cylinder cart.
- 2.4. Safety toe footwear is recommended when moving gas cylinders.
- 2.5.

3. APPARATUS AND MATERIALS

- 3.1. Tank cart
- 3.2. Regulator designed for gas being dispensed
- 3.3. Adjustable wrench(Crescent wrench)
- 3.4. End wrench, various sizes
- 3.5. Teflon tape

4. REAGENTS

- 4.1. Soap solution (Snoop[®])
- 4.2.

5. INSTRUCTIONS

- 5.1. Removing a regulator
 - 5.1.1. Close the valve on the compressed gas cylinder
 - 5.1.2. Close any valves on the output of the regulator as necessary
 - 5.1.3. Using an adjustable end wrench or other appropriately sized wrench loosen the regulator nut on the cylinder valve.



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NOTE: *Unless the gas cylinder is completely empty the system will be under pressure (not recommended). Use caution when loosening the regulator nut from the cylinder valve.*

- 5.1.4. Remove the regulator by unscrewing the regulator nut from the cylinder valve.
- 5.1.5. Set the regulator carefully aside.
- 5.1.6. Screw a cylinder cap to the top of the gas cylinder
- 5.1.7.

5.2. Attaching a regulator

- 5.2.1. Ensure compressed gas cylinder is secured in position.
- 5.2.2. Ensure that the regulator is appropriate for the gas being used.
- 5.2.3. Remove cylinder cap
 - 5.2.3.1. Set cylinder cap aside in nearby location for later use
- 5.2.4. Remove any plastic wrapping or plugs from regulator valve
- 5.2.5. Attach regulator to valve
 - 5.2.5.1. Using the nut on the regulator screw it into or onto the threaded part of the valve hand tight.

NOTE: *A standard gas regulator is right threaded and is tightened by rotating clockwise (right-handed). Fuel gas regulators (oxygen, acetylene, etc.) are typically reversed threaded and are tightened by rotating counter-clockwise (left-handed), and can generally be identified by a notch in the faces of the regulator nut.*

- 5.2.5.2. Using an adjustable end (Crescent) wrench or other wrench of appropriate size tighten the regulator nut firmly.
- 5.2.5.3. Leak check the regulator
 - 5.2.5.3.1. Standing to one side of the regulator (not in front) open the gas cylinder valve to pressurize the regulator
 - 5.2.5.3.2. Close the gas cylinder valve
 - 5.2.5.3.3. Listen for any leaks
 - 5.2.5.3.4. Watch the supply pressure gauge on the regulator for any decreases that would indicate a leak

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- 5.2.5.3.5. Add a small amount of soap solution to both sides of the regulator nut.
5.2.5.3.5.1. Watch for any bubbling in any location around the regulator nut

- 5.2.5.3.6. If any leaking is observed tighten the regulator nut further
5.2.5.3.6.1. Repeat steps 5.2.5.3.1 - 5.2.5.3.6 until no leaking is observed.

NOTE 1: *If tightening does not stop gas leaks Teflon tape may be used but is not recommended. If Teflon tape is needed remove the regulator following steps 5.1.4-5.1.4 then repeat steps 5.2.5.1 - 5.2.5.3.6.1 until no leaking is observed.*

NOTE 2: *If tightening and/or Teflon tape does not eliminate leaking the regulator or the cylinder valve may be damaged. Remove the regulator following steps 5.1.4-5.1.4 and replace with a new or different one. Repeat steps 5.2.5.1 - 5.2.5.3.6.1 until no leaking is observed. Notify stockroom personnel if issues persist.*

- 5.2.5.4. If no leaking is observed or have been eliminated open the cylinder valve until the valve stops
5.2.5.4.1. When the valve is fully opened close the valve $\frac{1}{4}$ turn from the full position

Note: *By opening the valve then closing slightly it becomes easier to determine if the valve is open or closed during later use.*

- 5.2.5.5. Open required valves on the output of the regulator.

Note: *It is recommended to leak check any fittings attached to the output of the regulator at this step using the soapy solution in step 5.2.5.3.5 if the regulator was physically moved after being detached from a cylinder. Tighten or replace any fittings as needed.*

- 5.2.5.6. Adjust regulator flow as needed.

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5.3. Moving a cylinder

5.3.1. Obtain a cylinder cart from their storage location.

5.3.2. Ensure that the cylinder cap is on tightly

NOTE: *Never move a cylinder with a regulator attached or without a cylinder cap in place.*

5.3.3. Unhook cylinder from restraint strap at storage location.

5.3.4. Roll cylinder onto cylinder cart in upright position

5.3.4.1. Secure the cylinder to the cart with the attached restraining chain.

5.3.5. Using the cylinder cart move the cylinder to the desired location.

5.3.6. Unhook the restraining chain.

5.3.7. Roll the cylinder into the new location.

5.3.8. Hook the restraining strap around the cylinder.

5.3.9. Return the cylinder cart to its storage location.

6. Cleanup

6.1. Wipe up any remaining liquid from leak checking.

6.2. Dispose of all paper towels, plastic wrapping, and/or broken parts appropriately.

6.3. Return any tools used to their proper locations.