1. **Purpose**
	* 1. To establish requirement for compressed gas and compressed air, and to ensure compliance with Federal and State Requirements.

This standard applies to all operations in which compressed gas cylinders are used, stored, transported, or handled, **except the following**:

1. Fire extinguishers
2. Self-contained breathing apparatus (SCBA) cylinders
3. Chlorine cylinders
4. Liquefied petroleum gas (LPG) cylinders
5. **Responsibility**
	1. The Key Supervisor shall be responsible for implementing and ensuring compliance with this procedure, including performing the required inspections.
	2. Employees shall be responsible for complying with the provisions of this procedure.
6. **Definitions**

Not Applicable

1. **General Requirements**
	1. Compressed gas and compressed air shall be installed, transported, and maintained in accordance with the following statutory requirements:
2. 29 Code of Federal Regulations (CFR) 1910, Subpart H; Hazardous Materials
3. 29 Code of Federal Regulations (CFR) 1926, Subpart J; Welding and Cutting
4. Washington Administrative Code (WAC) 296-24, Part K; Compressed Gas and Gas Equipment.
5. Washington Administrative Code (WAC) 296-155, Part H; Welding and Cutting
	1. COMPRESSED GAS CYLINDERS
		1. Cylinders shall not be used for any purpose other than that for which they are designed.
		2. Safety devices in regulators or on cylinder valves shall not be tampered with.
		3. Every cylinder shall be considered to be full and handled accordingly, even if it is empty.
		4. Mixing gases, transferring from one cylinder to another, or refilling gas cylinders shall be prohibited.
		5. Approved reducers and regulators shall be used; gas shall not be used from cylinders without reducing pressure through specifically approved regulators.
		6. Connecting devices shall be free of oil, Teflon tape, and grease, and shall be the proper size for the cylinder (have threads corresponding to those on the cylinder valve).
		7. Cylinders shall not be dragged, dropped, or struck.
		8. Compressed gas cylinders shall be stored in areas that are safe, dry, well ventilated, and protected from the weather. Compressed gas cylinders shall be protected from direct sun and weather conditions. Cylinders shall not be exposed to temperatures above 125º F.
		9. Oxyacetylene gas systems shall be equipped with reverse flow gas check valves on all hoses.
		10. Gaseous hydrogen systems shall be equipped with pressure relief devices and shall be protected from tampering. These relief devices shall be arranged so that if actuated, they have an unobstructed upward vent path to open air.
		11. Cylinders with dents, burns, or other signs of damage shall not be used.

* + 1. All compressed gas cylinders shall be clearly labeled or tagged to indicate:
1. Date the cylinder was delivered (tag).
2. Date the last hydrostatic test was performed (stamp).
3. Cylinder contents (label with either chemical or trade name).
4. Whether the cylinder is empty (tag empty cylinders as “Empty or “MT”).
	* 1. Cylinder tags or markings shall not be removed or altered

NOTE: Cylinder markings shall be made using stencils, stamps, or durable labels and tags that are legible and not readily removable. When practical, these markings shall be on the cylinder shoulder. By itself, color-coding is not adequate marking.

* 1. MANIFOLD COMPONENT SELECTION AND INSTALLATION: The entire manifold assembly shall be Factory Mutual (FM) approved or Underwriters Laboratory (UL) listed for use with compressed gases. All manifolds and manifold parts shall be used only for the gas or gases for which they are approved.
		1. Cylinder manifolds shall be installed under the supervision of a person-in-charge who is familiar with the uses of the gas at that facility.
		2. Compressed gas manifolds shall be designed to meet the applicable National Fire Protection Association (NFPA) standard(s).
		3. Flammable gas piping systems shall be grounded and bonded in accordance with the applicable NFPA standard.
	2. PROCUREMENT SPECIFICATIONS AND LIMITS: Requisitions for cylinders and hardware shall include the following specification when applicable:
		1. Portable cylinders used to store and/or ship compressed gas shall be constructed and maintained in accordance with DOT regulations (U.S. Department of Transportation, 49 CFR, parts 171-179).
		2. Devices used on compressed gas cylinders shall comply with American national Standards Institute and Compressed Gas Association Standards C-4 and V-1.
1. **Procedure**
	1. General Gas Cylinder Operating Precautions

5.1.1 Cylinder valves shall be opened slowly.

* + 1. To ensure that the valve can be shut quickly a key, handle, or nonadjustable wrench shall be installed on cylinder valve stems (if the cylinder valve does not have a permanent hand wheel).
		2. When the work is complete, all valves and regulators shall be closed and the gas lines and regulators are drained. The adjusting screw shall be “backed out”. (This does not include manifold gases.)
		3. Cylinders shall be secured upright and protected against being knocked over, or are secured in the position suggested by the manufacturer.
		4. Difficult connections shall not be forced. The threads on a regulator or union shall match those on the cylinder valve outlet.
		5. Only regulators and pressure gauges on the gases for which they are designed and intended shall be used. Repair, modification, or alteration on cylinders, valves, or attachments shall be performed by the manufacturer/authorized service center.
		6. Before connecting to a cylinder valve outlet, the cylinder valve shall be “cracked” for an instant to clear any dust or dirt from the opening and then the valve is shut. (Always direct the valve nozzle away from yourself and others before “cracking” the valve.)
		7. Acetylene cylinder valves shall be preferably opened three-fourths (3/4) of a turn or less; acetylene cylinder valves shall not be opened more than one and one-half (1-1/2) turns.
		8. Compressed gas cylinders shall be secured upright in an approved manner, with each cylinder secured snugly.
	1. Storage Requirements
		1. Cylinders containing oxidizing gases shall be stored away from flammable substances (such as oil and volatile liquids).
		2. Cylinder shall be secured and stored upright and, for cylinders that can be capped, with the protective valve cap installed hand-tight.
		3. Cylinders shall not be stored near elevators, gangways, stairwells, or any other places where they are likely to be knocked down or interfere with traffic.
		4. Limits shall be observed on the number of cylinders allowed in storage (inside or outside) set by the applicable NFPA standard.
		5. Smoking/Hot work shall be prohibited within 25 ft. of flammable gas cylinder storage areas. Storage areas containing flammable gases shall be posted “NO SMOKING / No hot work allowed”
		6. Empty cylinder shall be segregated from other cylinders and labeled or tagged “Empty” or “MT.” The cylinder valve on each empty cylinder shall be shut, and the cylinder capped (where possible).
		7. Acetylene cylinders shall be stored valve end up.

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* + 1. Oxygen cylinders not in use shall not be stored within 20 ft. of cylinders containing flammable gases or combustible materials unless the two kinds of cylinders are separated by a fire wall that is at least five feet tall and has a fire-resistance rating of at least one hour.
	1. Handling/Transport
		1. Cylinders shall be secured upright on an approved cylinder cart or other device, their regulators removed, and the valve-protection caps when possible installed before moving the cylinders.
		2. Cylinders without valve protection caps (e.g., inert gas cylinders such as 10 and 40 cubic foot capacity cylinders, #1 and #2 oxyacetylene bottles, etc.) shall have their regulators protected by securing the cylinder upright.
		3. All cylinder valves shall be checked to ensure they are shut before moving the cylinders.
		4. Compressed gas cylinders shall be secured to a cradle, boat, or suitable platform before they are lifted by crane or derrick. Cylinder shall not be lifted by magnetic devices or by attaching hooks or straps to the protective caps: instead, they are hoisted with an approved lifting device (such as a cage-type lifting platform with a rail for securing the cylinders).
		5. Cylinders shall be rolled for only short (less than 15 ft.) distances using the curve of the bottom cylinder edge, but shall not be dragged across the ground. The valve protection cap shall be installed before cylinder is rolled.
		6. A cylinder hand cart or other suitable device shall be used to transport cylinders more than 15 ft. Cylinders shall be secured upright to the cart or suitable firmly to ensure that the cylinders are not dropped. The valve protection cap shall be installed before a cylinder is moved.
		7. When moving cylinders, they shall be protected from cuts or abrasions.

**6.0 Records**

Not Applicable

**7.0 References**

Compressed Gas Association Standards (ass applicable)

49 Code of Federal Regulations (CFR), Parts 171-179; Department of Transportation

Requirements for hazardous Materials

**8.0 Attachments**

Not Applicable