

Compressed Gas Cylinders

SAFETY POLICY MANUAL - SECTION 3.0 - POLICY NO. HM 2.7



SAFETY DEPARTMENT | 6001 UNIVERSITY BOULEVARD MOON TOWNSHIP, PA 15108 412-397-4343

I. PURPOSE:

The purpose of this policy is to ensure faculty, staff, and visitor safety by implementing procedures for the handling, transportation and/or storage of compressed gases and cylinders. All employees utilizing compressed gas cylinders must be trained in the proper handling of cylinders, use of cylinder trucks and supports, and cylinder valve protection caps.

II. SCOPE & APPLICABILITY:

This policy applies to all Robert Morris University employees handling or using compressed gas cylinders.

III. REFERENCES:

- A. OSHA 29 CFR 1910.101 Compressed Gases
- B. OSHA 29 CFR 1910.252, Welding Cutting and Brazing
- C. Compressed Gas Associate (CGA) Pamphlet P-1

IV. DEFINITIONS:

- A. Compressed Gas: Any mixture of gases in a container with a pressure exceeding 40 psi. at 70F, or 104 psi. at 130F, or any flammable liquid with an absolute vapor pressure exceeding 40 psi at 100F.
- B. Storage: OSHA considers a cylinder to be in storage when it is reasonably anticipated that gas will not be drawn from the cylinder within 24 hours (overnight hours included).

V. PROCEDURE:

A. GENERAL:

1. Compressed gases shall be purchased of a size (container size) that is appropriate for the intended use and not larger than necessary. Containers/cylinder should also be returnable.
2. Upon receipt, each cylinder or container will be inspected by the Receiving Department to ensure that it is clearly labeled with the contents (proper grade, gas type and labeling). Cylinders, which are not properly labeled, will be refused and/or returned to the vendor.
3. Any container/compressed gas not meeting all of the requirements (grade, type and labeling) will be returned to the manufacturer/supplier. Any record of returns will be maintained by receiving department.
4. All compressed gas cylinders must be labeled, handled and/or stored in accordance with applicable rules & regulations including OSHA, DOT, NFPA and similar agencies.
5. Container identification may not be removed, defaced or otherwise altered – as per RMU's Hazard Communication Policy.
6. The receiver will inspect the cylinders for any obvious external damage. Cylinders with obvious damage will be refused and returned to the vendor immediately.
7. The packaging slip will be kept on file in the Receiving Department.

B. STORAGE OF CYLINDERS:

Areas where compressed gas cylinders will be stored within the University must be designated as such and must comply with the following regulations:

1. Storage areas should be designated by hazard class and marked clearly with warning signs that restrict access.
2. Storage areas must be assigned places away from elevators, stairs, corridors and similar egress paths.
3. Full and in-use containers should be separated from empty containers. As a minimum, separate storage includes separate storage racks and signage indicating full and empty.
4. Cylinders shall be kept away from heat and ignition sources, and away from corrosive chemicals or fumes.
5. Cylinders shall be stored in well-protected, well-ventilated, dry locations. Storage areas must be of fire-resistant construction where such gases are being stored.
6. Cylinders (oxygen) must be separated from fuel gas or combustible materials. Incompatible gases must also be segregated by at least 20 feet or half-hour rated barrier.
7. Assigned storage spaces must be in a location where cylinders will not be knocked over or damaged by passing or falling objects.
8. All compressed gas cylinder must be stored in an upright position using an approved chain, strap or floor anchor/stand. Chains or straps should be secured around the top 1/3 of the cylinder.
9. Valve protection caps shall always be in place, hand-tightened, except when cylinders are in use or connected for use. Empty cylinders shall have valves closed.
10. Containers must be legibly identified as to the contents.
11. It is recommended that departments which use and store compressed gas cylinders designate an employee to periodically check cylinders to ensure compliance with the aforementioned procedures.

C. SAFE HANDLING & USE:

1. Personnel shall be familiar with the potential hazards associated with compressed gases.
2. Cylinder tank trucks/carts with safety chains are the approved method of transporting/delivering large cylinders. Cylinder caps must be securely fastened during storage and transport.
3. Safety caps must be securely fastened unless in-use.
4. All individuals responsible for the connection of compressed gases to a supply system will ensure proper gas identity and proper connection valves before connection.
5. Cylinder tags should be used to designate the status of compressed gases including; "full", "in-use", or "empty".
6. Never expose cylinder to temperature extremes, direct heat, or flames.
7. Empty gas cylinders must be closed, secured and identified as "empty".
8. Compressed gas piping, regulators, and flow equipment must be:
 - a) Compatible with the chemical & physical properties of the gas.
 - b) Capable of withstanding gas supply pressures.
 - c) Installed and operated by trained & qualified persons familiar with the specific hazards of the gas in use.
 - d) Grounded to minimize sparks due to static discharge when using a flammable gas.
 - e) Provided with a means for safely purging the system and device to prevent back flow of gases or liquids into the gas storage cylinders when using hygroscopic corrosive gases (such as anhydrous hydrogen chloride).

- f) Leak tested upon installation and routinely while in-use. Leak test around valve gland, regulator connections, and fittings.

D. EMERGENCY PROCEDURES FOR COMPRESSED GAS CYLINDERS:

Personnel should be aware of common emergency situations involving compressed gases and their associated hazards including:

1. An unsecured cylinder may tip and become subject to damage that the release of internal pressure may cause the cylinder to become a dangerous high-speed projectile.
2. A fire threatening a compressed gas cylinder can cause a rupture or explosion.
3. A flammable gas leak can cause a build-up of explosive gases.
4. A leak can cause high concentrations of gas that exceed safe breathing levels or an inert gas leak can cause an oxygen deficient atmosphere, which may be a threat to life safety.
5. An unplanned chemical reaction may cause a cylinder to rupture or explode.
6. Fire and other emergencies involving compressed gas cylinders should be handled with extreme caution:
 - a) Do not take any unnecessary risks to save equipment – evacuate the area.
 - b) Only if safe to do so, release pressure in affected pipelines and shut off equipment prior to evacuation.
 - c) Never attempt to extinguish a flammable gas leak (fire) without stopping the flow of gas.
 - d) Any gas cylinder involved in a fire or suffering similar damage must be taken out of service and returned to the supplier.

E. COMMON LEAK POINTS AND POSSIBLE REPAIRS:

1. Valve outlet / regulator connections – dirt in connection, damaged connector or washer.
2. Valve stem spindle – tighten adjustable gland nut $\frac{1}{4}$ turn with valve stem loosened or tighten lock nut if present on gland fitting.
3. Cylinder valve to cylinder joint – cannot be repaired in the field. Remove from service, label, and return to supplier.
4. Valve closure – tighten valve or if defective, remove from service and return to supplier.
5. Leaking gas control equipment / pipelines – isolate gas supply, release pressure, and purge equipment of hazardous gas before attempting repair.

F. DISPOSAL OF COMPRESSED GAS CYLINDERS:

1. Contact your cylinder vendor / supplier to return empty, damaged, excess, unknown and similar compressed gas cylinders.
2. If a cylinder is non-returnable, contact RMU's Environmental Health & Safety for disposal in accordance with the Hazardous Waste Management and Disposal policy.

VI. RESPONSIBILITIES:

A. DEPARTMENT MANAGER:

1. Ensure that the compressed gas cylinder procedures are followed and take appropriate corrective action when such procedures are not followed.
2. Ensure that appropriate employees within the department are provided training in the safe use of compressed gas cylinders.

B. DEPARTMENT EMPLOYEE:



1. Department employees handling or using compressed gas cylinders are required to follow the procedures outlined in this policy.

VII. POLICY REVIEW:

This policy will be reviewed by the Hazardous Materials and Waste Subcommittee and the Lab Safety Subcommittee to address equipment, product, process and similar changes.

Implementation Date: February, 2012
