

Version: 24.0	Compressed Gas Cylinders	
	Effective Date	May 21, 2024
	Page	1 of 7

Brunel Energy, Inc.

Compressed Gas Cylinders

Contents

1. Purpose	2
2. Applicability	2
3. Definitions	2
4. Responsibilities	3
5. Procedure	3
5.1. Health Hazards	3
5.2. Storage and Handling of Compressed Gas Cylinders	3
5.3. Use of Compressed Gas Cylinders	5
5.4. Emergency	6
6. Training	6
7. Reference	7

Version: 24.0	Compressed Gas Cylinders	
	Effective Date	May 21, 2024
	Page	2 of 7

1. Purpose

- 1.1. Brunel Energy, Inc., hereinafter referred to as, the “Company,” has established a program compliant with OSHA to prevent accidents and injuries that may result from misuse, mishandling, or improper storage of the compressed gas cylinders.

2. Applicability

- 2.1. This policy applies to employees, subcontractors and/or visitor(s) of the Company. For the purposes of this policy, an employee shall be considered on the job whenever he/she is:
 - 2.1.1. On or in, any Company or client property, including parking areas; or
 - 2.1.2. On Company time even if off Company premises (including paid lunch, rest periods and periods of being on call).
- 2.2. As a condition of employment, Company employees are required to abide by additional governmental or customer policies and requirements that may be imposed at a worksite in addition to the requirements of these policies and procedures. Nothing set forth in this policy constitutes, construes, or interprets in any way as a contract of employment.

3. Definitions

- 3.1. **Compressed Gas** is defined by the DOT as “...any material or mixture having in the container an absolute pressure exceeding 40 psi at 70F, or, regardless of the pressure at 70F, having an absolute pressure exceeding 104 psi at 130F: or any liquid flammable material having a vapor pressure exceeding 40 psi absolute at 100F, as determined by ASTM d-323.
- 3.2. **In use** — A compressed gas cylinder is considered “in use” in the following situations:
 - 3.2.1. Gas is flowing from the cylinder.
 - 3.2.2. Cylinder gas is being used to maintain pressure in a supply line.
 - 3.2.3. Cylinders are in transit.
 - 3.2.4. Cylinder is “connected for use” during and between operations using the gas.
- 3.3. **Connected for use** — A compressed gas cylinder is considered “connected for use” when personnel can assume that gas will be drawn from the cylinder within the next 24 hours from the time the cylinder is shut down. For example, at the end of a shift, the welder secures the cylinder by shutting down the valve and depressurizing the regulator and downstream equipment but does not disconnect equipment. The regulator reads “0” and welding operations will resume 15 hours later at the start of the welder’s next shift.
- 3.4. **Cracking** is the action of slightly opening and then closing the valve on a compressed gas cylinder before connecting the regulator. Cracking clears the valve of any dust or dirt that might otherwise enter the regulator.

Version: 24.0	Compressed Gas Cylinders	
	Effective Date	May 21, 2024
	Page	3 of 7

- 3.5. **Storage** — A cylinder is considered in storage when it is not in use or in transit. Personnel must meet cylinder storage requirements when they can reasonably assume that gas will not be drawn from the cylinder within the next 24 hours from the time the cylinder is shut down.

4. Responsibilities

- 4.1. Manager(s) are:
- 4.1.1. Responsible for implementing, training, supporting, and enforcing the requirements of this procedure in their locations.
- 4.2. HSE Supervisor(s) are:
- 4.2.1. Responsible for assisting management in the implementation of this procedure.
 - 4.2.2. Responsible for ensuring the policy is fully implemented in their areas of control.
 - 4.2.3. Responsible for consulting with employees as part of undertaking the hazard identification, risk assessment, and control process.
- 4.3. Employee(s) are:
- 4.3.1. Responsible for following all requirements detailed in this policy.

5. Procedure

- 5.1. Health Hazards
- 5.1.1. Inert gases can displace oxygen resulting in asphyxiation.
 - 5.1.2. Toxic gases may cause adverse health effects depending on the type of gas, the route of entry, and the dose, which is dependent on the concentration and duration of exposure.
 - 5.1.3. Flammable gases can cause fire or explosion when ignited. Some flammable gases are also toxic.
 - 5.1.4. Oxidizers, while not flammable, react violently with other combustible materials causing them to burn more rapidly.
 - 5.1.5. Rapidly expanding gas is extremely cold and will cause freezing burns to exposed skin on contact.
 - 5.1.6. Any pressurized gas can explode if the cylinder is improperly stored, handled, or exposed to high heat.
- 5.2. Storage and Handling of Compressed Gas Cylinders
- 5.2.1. Prior to use, all cylinders, portable tanks, and cargo tanks shall be visually inspected the cylinder to ensure the following:
 - 5.2.1.1. That it is within the required (normally 5-year) hydrostatic test period.

Version: 24.0	Compressed Gas Cylinders	
	Effective Date	May 21, 2024
	Page	4 of 7

- 5.2.1.2. Visually inspect the cylinder for gouges, dents, cuts, corrosion, pitting or other defects that might weaken the cylinder.
- 5.2.1.3. Visually inspect the hoses and/or connections.
- 5.2.1.4. Safety relief devices are in place, are not painted over and are not damaged.
- 5.2.1.5. The contents of compressed gas cylinders are clearly identified. Label or stamp identifying the contents and associated warnings are marked on each cylinder.
- 5.2.1.6. All non-complying cylinders must be returned to the supplier.
- 5.2.1.7. Caps must be attached to each cylinder before pick-up.
- 5.2.2. All gas cylinders are clearly identified. Gas identification should be stenciled or stamped on the cylinder or affixed with a label. No compressed gas cylinder should be accepted for use that does not legibly identify its content by name.
- 5.2.3. Any damaged cylinder or any cylinder that is not satisfactorily identified as to contents shall not be used.
- 5.2.4. When a cylinder cap cannot be removed by hand, cylinder shall be tagged "Do Not Use" and returned to the designated storage area for return to vendor.
- 5.2.5. Do not tamper with or attempt to repair defective valves or safety relief devices on cylinders. Such cylinders should be identified, and arrangements made for returning them to the vendor immediately.
- 5.2.6. All cylinders must be upright and secured at all times when using, storing, or transporting. A cylinder can be properly secured using a substantial chain, cable, or other metal closure. Anhydrous ammonia cylinders are an exception and stored horizontally, though they must be secured always. (FS&S SCBA's are exempt)
- 5.2.7. Keep valves closed when not in use.
- 5.2.8. Caps must be on all cylinders when they are not connected to a system.
- 5.2.9. Keep oil and grease away from cylinder valves and fittings to prevent autoignition.
- 5.2.10. Cylinders may be stored in the open but should be protected from the ground beneath to prevent rusting. Cylinders may be stored in the sun except in localities where extreme temperatures prevail, or in the case of certain gases where the supplier's recommendation for shading shall be observed. If ice or snow accumulate on a cylinder, thaw at room temperature, or with water at a temperature not exceeding 125 F.
- 5.2.11. Keep cylinders away from exposure to sparks, hot slag, open flame, and all potential sources of excessive heat (minimum 10-foot clearance from work area on the same level unless cylinders are otherwise shielded).
- 5.2.12. Cylinder storage areas shall be in a well-ventilated area that have signage prominently posted with the names of gases to be stored.
- 5.2.13. Acetylene Cylinders must never be placed in a horizontal position.

Version: 24.0	Compressed Gas Cylinders	
	Effective Date	May 21, 2024
	Page	5 of 7

- 5.2.14. Oxygen and flammable gases must be separated during storage by at least 20 feet or a barrier with a 30-minute fire rating at least five feet in height. Cylinders on all burning carts must also be segregated by a barrier that is a minimum 1/8" steel. This barrier shall extend to a width no less than the width of the cylinders.
- 5.2.15. Oxy-Acetylene cylinders must be removed from operating areas when not in use, including overnight.
- 5.2.16. Compressed gas cylinders, which contain a liquid reservoir, shall not be placed in a position where in case of an emergency the liquid phase would be released as opposed to the gaseous phase unless required by the process.
- 5.2.17. Full or empty cylinders and cylinders no longer in use should be stored in a separate designated area labeled for full and empty cylinders. The name of the gas should be prominently posted.
- 5.2.18. Appropriate tools to open and close cylinder valves should be used.
- 5.2.19. Never lift a cylinder with slings, by the caps, by a rope or using magnets.
- 5.2.20. Never use a cylinder as a support or a roller.
- 5.2.21. Avoid cylinder contact with electrical circuits.
- 5.2.22. Never strike an arc or tap an electrode against a cylinder.
- 5.2.23. When compressed gas cylinders are transported by truck, the cylinders must be vertical secured position in place "valve end up." (Valve end up includes conditions where the container axis may be inclined as much as 45 degrees from vertical.) When using public roads, the cylinders must be secured, and all applicable DOT regulations followed.
- 5.2.24. All cutting torches shall have flash back valves at the torch and regulator gauges. The valves on the torch and all connections shall be examined daily for leaks before lighting the torch. If leakage is noted around the valve stems, tighten the packing nuts and if this does not correct the situation, have proper repairs made by an authorized person.
- 5.2.25. All air receivers shall be equipped with an indicating pressure gauge
- 5.3. Use of Compressed Gas Cylinders
 - 5.3.1. When connected to a process operation, the line from the cylinders to the process must contain a block valve and a check valve to prevent backfilling of the cylinder when it empties.
 - 5.3.2. The proper pressure-reducing regulator (for the gas being used) must be installed on the cylinder before use.
 - 5.3.3. Inspect and test the regulator to verify proper operation before cylinder use.
 - 5.3.4. Tubing, piping, or hose used to transfer gas shall be inspected before use and must be able to withstand the cylinder pressure.
 - 5.3.5. Never try to mix gases in a cylinder or refill empty cylinders. The only exception is our recharging of breathing air cylinders by the Fire Department.

Version: 24.0	Compressed Gas Cylinders	
	Effective Date	May 21, 2024
	Page	6 of 7

- 5.3.6. Safety valves are tested, if valves cannot be operated by hand, do not use a hammer or a wrench on them. Return the cylinder to the supplier if valves are defective.
- 5.3.7. After all the gas in the cylinder has been used, close the valve tightly, remove the regulator, install the cap, return the cylinder to the empty cylinder rack, and place an empty cylinder tag on the cylinder.
- 5.3.8. As an exception to the above, jobs utilizing approved burning & welding carts, which have not been completed, may, under certain conditions, be stored temporarily in an operating area. The following conditions without exception are:
 - 5.3.8.1. Work must be scheduled to continue within 5 working days.
 - 5.3.8.2. Operations must give permission each and every time this practice takes place.
 - 5.3.8.3. The cart must be stored in a low-risk area. (Generally outside battery limits)
 - 5.3.8.4. The caps are put back on the cylinders.
- 5.3.9. Compressed air shall not be used for cleaning purposes except where the pressure is reduced to less than 30 P.S.I. and effective chip guarding and personal protective equipment is implemented.
- 5.3.10. The drain valve on air receivers shall be opened and the receiver completely drained frequently and at such intervals as to prevent the accumulation of excessive amounts of liquid in the receiver.

5.4. Emergency

- 5.4.1. If leaks occur, place cylinders outside and away from all ignition sources. Move upwind. Warn other personnel of the hazard and arrange for disposal.
- 5.4.2. If a harmful exposure occurs, notify headquarters, and seek immediate medical attention following the procedures outlined in the specific SDSs.
- 5.4.3. Protect yourself from the hazard first when responding to a person downed by a toxic gas.
- 5.4.4. PPE will depend upon the product being released.

6. Training

- 6.1. Employees who use compressed gas cylinders shall receive training in their proper use, handling, and storage.
- 6.2. Training shall be conducted upon initial assignment and annually thereafter.
- 6.3. Re-training as necessary or as changes to procedures are applicable. All training shall be documented.
- 6.4. Manufacturers are required to include appropriate health hazard information on compressed gas materials on safety data sheets (SDS) as required under OSHA's Hazard Communication standard (29 CFR 1910.1200).

Version: 24.0	Compressed Gas Cylinders	
	Effective Date	May 21, 2024
	Page	7 of 7

- 6.5. Obtain and read the manufacturer's SDS for health hazard information on the compressed gas cylinders that are used.

7. Reference

- 7.1. OSHA 1910.134 - Respiratory Protection
- 7.2. OSHA 1910.132 - Personal Protective Equipment
- 7.3. OSHA 1910.95 - Occupational Noise Exposure
- 7.4. OSHA 1910.1200 - Hazard Communication
- 7.5. HEW Publication No. (NIOSH) 74-104 (1974)
- 7.6. Compressed Gas Association, P-1, "Safe Handling of Compressed Gases in Containers."