



COMPRESSED GAS CYLINDERS

Storage, Handling and Use of Oxygen, Fuel Gas and Compressed Gas

POLICY STANDARD

Identify every cylinder by label, keep it secured upright, protect the valve and use only gas-compatible equipment. Leaking, damaged, contaminated, overheated or unidentified cylinders shall be isolated and handled through the supplier or emergency services - never improvised in the field.

PHEIFER BROTHERS CONSTRUCTION CO., INC.

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USE OF THIS POLICY

This policy establishes minimum company expectations and is not all-inclusive. The cylinder label/SDS, supplier and equipment-manufacturer instructions, hot-work permit and any more protective project requirement also apply.

Primary Regulatory References

- 29 CFR 1926.350 - Gas welding and cutting
- 29 CFR 1926.352 and 1926.353 - Fire prevention and ventilation during welding/cutting
- 29 CFR 1926.153 - Liquefied petroleum gas
- 29 CFR 1926.59 / 1910.1200 - Hazard communication
- Applicable DOT hazardous-material transportation requirements for highway transport

1. Purpose, Scope and Responsibilities

Purpose and Scope

- Protect employees, the public and property from high-pressure release, fire/explosion, oxidizer-enhanced combustion, asphyxiation, toxicity, cold burns and cylinder projectiles.
- Applies to oxygen, acetylene, propane/LP-gas, fuel gas, argon, nitrogen, carbon dioxide and other portable compressed/liquefied gas cylinders used at projects, shops, yards and vehicles.
- Bulk systems, medical oxygen, diving gases, refrigerants or unusual toxic/reactive gases require additional written procedures and specialist review.

Management / Project Management

- Provide approved cylinders, compatible regulators/hoses/torches, carts/restraints, storage, fire protection, training and supplier support.
- Identify DOT/transport, owner, hot-work, confined-space and environmental requirements before work.

Foreman

- Complete pre-task planning; designate storage/use areas; verify authorized employees, inspection, separation, restraint, ventilation and emergency access.
- Stop work and isolate the area when a cylinder/equipment condition or gas release is unsafe.

Authorized Users

- Use only gases/equipment for which trained. Read the label/SDS, inspect before use and follow manufacturer lighting/shutdown procedures.
- Never alter, repair, refill or defeat a cylinder valve, relief device, regulator or protective device.

Employees

- Keep clear of cylinders and hoses, protect them from damage and report leaks, odors, frost, heat exposure, missing labels or defects immediately.
- Every employee has stop-work authority without retaliation.

2. Hazard Identification and Pre-Use Planning

Identify the Gas

- Read the durable cylinder label and SDS. Do not identify contents by cylinder color, cap, hose or location alone.
- Confirm gas, purity/service, pressure, flammability, oxidizing/asphyxiant/toxic/corrosive hazards and required regulator/connection before acceptance.
- Treat an unlabeled, illegible or mismatched cylinder as unknown: tag it, secure it and contact the supplier. Never test by opening or smelling.

Task Assessment

- Identify quantity, duration, storage versus connected-for-use status, indoor/outdoor location, heat/ignition, traffic/impact, electrical, ventilation, confined/enclosed space and emergency shutdown.
- Coordinate hot work, fire watch/extinguisher, combustible removal/shielding, atmospheric monitoring, PPE and public/subcontractor protection.
- Consider low areas where propane/CO₂ may collect and high/enclosed areas where any gas may displace oxygen.

Equipment Selection

- Use only regulator, gauges, hose, fittings, check valves/flashback arrestors, torch, manifold and appliances approved/compatible for the specific gas, pressure and service.
- Never force a connection, change threads, use adapters to interchange oxygen/fuel lines or use makeshift fittings.
- Do not use oxygen equipment for other gases or introduce oxygen into pneumatic tools, ventilation, clothing cleaning or fuel tanks.

Location

- Select firm, level, ventilated placement protected from vehicles, cranes, falling objects, sparks, slag, electrical circuits, heat and unauthorized access.
- Keep shutdown valves accessible and route hoses away from passageways, ladders, stairs, sharp edges, hot work and pinch/crush points.

Stop Before Setup

- Do not proceed if label/SDS, compatible equipment, restraint, separation, ventilation, fire protection or trained user is missing.

3. Receiving, Identification and Cylinder Condition

Receiving Check

- Verify supplier label, cylinder/valve type, cap, apparent service condition and requested gas. Separate damaged or incorrect deliveries before acceptance.
- Check for dents, cuts, gouges, bulges, severe rust/corrosion, arc/burn marks, fire/heat exposure, damaged threads/valve, loose/leaking relief device, frost or unusual odor/sound.
- Do not use a cylinder with missing/illegible label, expired/invalid condition indicated by supplier rules, or evidence of damage/defect.

Valve Protection

- Keep the valve-protection cap in place and secured whenever the cylinder is not connected for use and when moving/storing, if designed for a cap.
- Caps protect valves; they are not lifting points. Never pry beneath a valve/cap or strike/hammer a stuck valve.
- Do not modify caps or use a regulator guard as a substitute unless the system is approved for that purpose.

Full and Empty Cylinders

- Treat empty cylinders as hazardous: close valve, relieve connected equipment, remove regulator when required, install cap, mark/status-segregate and secure upright.
- Do not rely on an 'empty' tag to mean depressurized. Residual gas/pressure remains.
- Keep full, empty, damaged/return and different hazard classes identified and arranged to prevent mix-up.

Supplier-Only Work

- Only the supplier/owner or authorized facility may refill, mix gases, repair cylinder valves/relief devices or perform cylinder requalification.
- Do not transfer gas between cylinders, heat to increase flow, patch leaks or attempt field cylinder repair.

Inventory

- Limit onsite quantity to operational need. Maintain location/quantity information needed for emergency response and reconcile returns.

4. Storage and Separation

General Storage

- Secure cylinders upright with a substantial chain, strap, rack or approved cart that prevents falling. Provide restraint at a height effective for cylinder size; add a second restraint when needed.
- Store in a well-protected, well-ventilated, dry assigned location away from stairs, elevators, exits/gangways, falling objects, traffic and tampering. Never store in unventilated lockers/cupboards.
- Protect from extreme heat, flames, hot slag, corrosive conditions, water accumulation and electrical circuits. Do not obstruct fire equipment or emergency routes.

Oxygen Separation

- Oxygen cylinders in storage shall be separated from fuel-gas cylinders and combustible materials - especially oil/grease - by at least 20 feet, or by a noncombustible barrier at least 5 feet high with at least a one-half-hour fire-resistance rating.
- A sheet of metal, partial divider or cylinder cart without documented compliant barrier is not automatically acceptable.
- Company practice is to maintain required separation whenever cylinders are not actively connected for immediate use; do not rely on informal '24-hour' interpretations.

Indoor Storage

- Inside buildings, store at least 20 feet from highly combustible materials and in protected, ventilated locations. Control ignition sources and accumulation.
- LP-gas containers awaiting use shall be stored outdoors as required by 1926.153; exterior quantity/distance and tamper-protection rules apply.

Placement for Use

- Keep cylinders far enough from welding/cutting so sparks, flame and slag cannot reach them; use fire-resistant shields when distance is impractical.
- Keep fuel-gas cylinders valve-end up and away from open flame, hot metal and artificial heat.
- Never place cylinders where they can become part of an electrical circuit or strike an arc on a cylinder.

Prohibited Uses

- Never use cylinders as rollers, supports, workstands, ground connections or anchorage points.

5. Moving, Hoisting and Vehicle Transport

Manual Movement

- Use a suitable cylinder cart/truck and secure the cylinder. For short positioning, tilt and roll on the bottom edge under control; never drag, slide, drop or allow cylinders to strike each other.
- Close valve before movement. Unless firmly secured on a special carrier intended to move connected cylinders, remove regulator and install valve cap.
- Do not carry by valve/cap, roll horizontally, lift with a rope/chain around the cylinder or place hands where a falling cylinder can crush them.

Hoisting

- Use an approved cradle, slingboard or pallet that secures cylinders. Do not use magnets or choker slings.
- Install caps, remove regulators unless the approved carrier/system permits otherwise, control the load and keep personnel clear.
- Do not hoist an ordinary wheeled cart unless specifically designed/approved as the required carrier and secured for lifting.

Powered Vehicle / Site Transport

- Secure cylinders in a vertical position on powered vehicles. Protect valves/caps from impact and prevent movement, tipping and contact with incompatible materials.
- Use ventilated/open transport arrangements appropriate to the gas. Never leave leaking cylinders in a cab, closed van, gang box or other enclosed vehicle.
- Keep smoking/ignition sources away and comply with load securement and hazardous-material transportation requirements.

Public-Road Transportation

- Only authorized drivers may transport. Verify shipping papers, markings/labels/placards, quantities, segregation, emergency information and vehicle requirements under applicable DOT rules.
- Do not transport connected torches/regulators unless an authorized compliant system and transport procedure specifically allows it.

Arrival

- Unload promptly to the assigned storage/use area. Reinspect after transport and secure before releasing restraints.

6. Setup, Regulators and Valve Operation

Before Connection

- Verify cylinder label, valve outlet and regulator service match. Inspect threads/seats, regulator body/gauges, adjusting screw and sealing components.
- Ensure regulator adjusting screw is backed out/no delivery pressure before opening cylinder, per manufacturer instructions.
- Keep oxygen valves, fittings and hands/gloves free of oil/grease. Never use petroleum products or unapproved thread sealants on oxygen equipment.

Clearing the Outlet

- Where required by 1926.350 and supplier/manufacturer procedure, briefly crack the valve before attaching the regulator to clear dust. Stand to the side of the outlet, not in front.
- Do not crack fuel-gas valves where gas can reach sparks, flame, hot work or ignition. Do not crack valves where the gas hazard or valve design/instructions prohibit it.

Opening

- Open cylinder valves slowly while standing to the side of the regulator. Do not stand in front of gauges or over the regulator.
- Fuel-gas cylinder valves shall not be opened more than 1-1/2 turns for quick closing. If a special wrench is required, leave it on the valve stem while in use; keep a wrench available for manifolded cylinders.
- Use a suitable regulator between fuel-gas cylinder/manifold and any torch/device. Never use cylinder pressure directly through a torch.

Pressure

- Set pressure according to torch/appliance manufacturer and tip size. Never exceed equipment ratings or supplier limits; acetylene shall not be used above 15 psig.
- If gauges creep, regulator vibrates, relief device activates, pressure cannot be controlled or connections leak, close valve and remove equipment from service.

Shutdown

- Close cylinder valve, extinguish/shut appliance per manufacturer sequence, bleed pressure from hoses/regulator, back out adjusting screw and close torch valves.
- Before regulator removal, close the cylinder valve and release pressure from the regulator.

7. Hoses, Torches, Manifolds and Protective Devices

Hose

- Oxygen and fuel-gas hoses shall be easily distinguishable and non-interchangeable; do not use a single hose with multiple gas passages.
- Inspect at the beginning of each shift for burns, cuts, cracking, abrasion, soft spots, leaks, damaged fittings and contamination. Remove defective hose.
- Hose exposed to flashback or severe damage must be tested to twice normal pressure, but not less than 300 psi, by an authorized method; doubtful hose shall not be used.
- Couplings must resist disconnection by straight pull. If parallel hoses are taped, cover no more than 4 inches in each 12 inches. Ventilate hose-storage boxes.

Torches

- Inspect each shift for leaking valves, couplings and tip connections. Do not use defective torches.
- Clean clogged tips only with proper tip cleaners/wires/drills. Light with friction lighter or other approved device - never matches, cigarettes or hot work.
- Follow manufacturer lighting, adjustment and shutdown sequence. Stop immediately for popping, sustained backfire, flashback, overheating or gas starvation.

Protective Devices

- Use manufacturer-approved reverse-flow check valves and flashback arrestors appropriate to the torch/system and gas; install, inspect and replace at specified locations/intervals.
- Protective devices supplement - not replace - correct pressures, clean tips, sound hose, proper shutdown and trained operation.

Manifolds

- Mark fuel-gas and oxygen manifolds with the gas name in letters at least 1 inch high. Place in safe, ventilated, accessible locations, not enclosed spaces.
- Prevent hose interchange; do not use adapters. Keep connections oil/grease free, cap unused header connections and keep valve access clear.

Repairs

- Only authorized qualified personnel may repair regulators, torches, hose assemblies or protective devices using approved parts/procedures.

8. Oxygen, Acetylene, Fuel Gas and Specialty Gases

Oxygen

- Oxygen is not flammable but greatly accelerates combustion. Keep it away from oil, grease, fuel, asphalt products and other combustibles.
- Never handle oxygen equipment with oily gloves, direct oxygen at clothing/skin, use it for ventilation/cleaning, or introduce it into fuel/oil tanks.
- Use oxygen-clean compatible equipment only. Suspected contamination requires removal from service and qualified cleaning/replacement.

Acetylene / Fuel Gas

- Keep valve end up. Open slowly and no more than 1-1/2 turns; keep required valve wrench in position.
- Never use acetylene above 15 psig, heat a cylinder, lay it horizontally for use or expose it to flame/hot metal.
- After a cylinder has been transported/laid improperly, follow supplier instructions before use; do not guess at required settling time.

Propane / LP-Gas

- Use approved LP-gas containers, valves, excess-flow devices, regulators, hose and appliances under 1926.153.
- Store containers awaiting use outdoors; protect from tampering and provide at least one approved 20-B:C extinguisher at storage locations.
- Keep portable heaters and containers at required separation; never aim a blower/radiant heater at an LP-gas container within 20 feet.

Inert Gases

- Argon, nitrogen, helium and carbon dioxide can displace oxygen without warning. Provide ventilation and atmospheric controls in enclosed/low areas.
- CO₂ releases can cause cold burns/frost and collect in low areas. Never enter a suspected oxygen-deficient area to rescue without trained/equipped responders.

Toxic / Corrosive / Reactive Gas

- Requires a written gas-specific plan, compatible cabinets/ventilation/detection, emergency equipment, exposure controls and specialist approval before site use.

9. Hot Work, Confined Spaces and Work-Zone Controls

Hot-Work Authorization

- Follow the Welding, Cutting and Hot Work Policy and permit process. Remove/protect combustibles, provide extinguisher and trained fire watch as required.
- Shield cylinders from sparks/slag/flame and protect adjacent employees/public from fire, fumes, radiation and falling hot material.
- Vent hollow spaces/containers and verify they are cleaned/purged as required before heating/cutting.

Confined / Enclosed Spaces

- OSHA prohibits taking oxygen, acetylene or other fuel-gas cylinders into confined spaces. Keep cylinders/manifolds outside and route only necessary hose under an approved entry/hot-work plan.
- At breaks and shift end, remove torches/hoses as required, shut gas at source and prevent leakage into the space.
- Use ventilation and atmospheric monitoring under the Confined Space and Respiratory Protection programs. Oxygen enrichment is also hazardous; never use oxygen for ventilation.
- Locate inert/specialty cylinders outside confined spaces whenever practicable; any use requires permit-space evaluation and control of oxygen displacement.

Traffic and Equipment

- Place cylinders outside travel/swing zones or protect with substantial barriers. High-visibility cones alone may not prevent impact.
- Do not route hoses across live travel without protected crossing and coordination. Keep cylinders away from crane loads and falling-object zones.

Electrical / Grounding

- Keep cylinders from energized conductors, welding leads and grounding paths. Never allow electrode holders or bare connections to touch cylinders.
- Provide GFCI/temporary power controls for related equipment and keep electrical components dry.

Work Over Water / Elevated Work

- Secure cylinders/equipment against falling and use designed lifting/support systems. Do not attach fall protection or rigging to cylinders/carts unless designed.
- Preserve safe access, PFD/fall protection and emergency rescue arrangements.

10. Leaks, Fire, Emergency Response and Disposal

Suspected Leak

- Stop work, eliminate ignition only if safe, warn others and evacuate/isolate based on gas/SDS and conditions. Do not touch, operate electrical switches or use a phone in a potentially flammable cloud.
- If trained and it can be done without exposure, close the cylinder valve. Ventilate from a safe location. Use approved leak-detection solution - never flame - only after the area is safe.
- Never move a leaking cylinder through an occupied/enclosed area. Contact supplier/fire department for direction.

Fuel-Gas Valve Leaks

- For a valve-stem leak, close valve and only trained personnel may tighten the gland nut as permitted by 1926.350(d)(5). If leakage continues, discontinue use, tag and remove from work area under a safe plan.
- A leak through valve/fuse plug/relief device or one that cannot be shut off requires immediate isolation, supplier/emergency response and removal only when safe.

Fire / Heat Exposure

- Call 911, evacuate and protect exposures from a safe location. A heated cylinder can rupture violently; do not approach, move or cool unless directed by fire professionals and trained to do so.
- Give responders gas types, quantities, location and whether cylinders were heated/impinged. Establish a large exclusion zone as directed.

Broken Valve / Major Release

- Treat as projectile, fire, toxic or oxygen-deficiency emergency. Do not chase, restrain or enter the release area.
- Shut remote supply only if designed and safe. Emergency responders control the event.

Exposure

- Move exposed person to fresh air only without becoming another victim; call 911 for breathing difficulty, unconsciousness, burns or suspected toxic/asphyxiant exposure.
- Flush cold-burn/chemical exposure as SDS directs and obtain medical care.

Return / Disposal

- Tag defective/empty cylinders, secure and return to supplier. Do not vent, scrap, puncture, burn or dispose of cylinders in ordinary waste.

11. Training, Inspection and Records

Training

- Train authorized employees before setup/use and when gas, equipment or procedure changes. Cover labels/SDS, hazards, storage/separation, movement, connections, operation, leak response and shutdown.
- Provide hands-on demonstration for carts, regulators, leak checks, torch lighting/shutdown, flashback response and emergency isolation.
- Toolbox talks reinforce but do not replace required task/hot-work/confined-space training.

Beginning-of-Shift Inspection

- Cylinder label/condition/cap/valve, upright restraint and location/separation.
- Correct regulator/gauges, fittings, hoses/couplings, torch/tip and protective devices; no oil/grease contamination.
- Fire extinguisher/fire watch, ventilation, access, hot-work permit and barriers ready.
- Valves/pressure stable, connections leak-free and hoses protected after pressurization.

Storage Inspection

- Foreman periodically verifies quantity, segregation, caps/valves, restraint, ventilation, combustibles, tamper/impact protection, extinguisher and housekeeping.
- Correct changed conditions after delivery, severe weather, impact, heat exposure, unauthorized access or relocation.

Records

- Maintain training/authorization, hot-work permits, storage/field inspections as required, equipment maintenance/repairs, supplier returns, incidents and corrective actions.
- Record cylinder identification/status sufficiently to coordinate supplier response without copying protected personal data.

Program Review

- Review at least annually and after incident, equipment/gas change or regulatory/manufacture update. Printed copies are uncontrolled unless formally issued.

Enforcement

- Unsecured cylinders, missing caps during storage/movement, oil on oxygen equipment, unauthorized repairs/adapters, bypassed protective devices or use after a stop condition are safety violations subject to corrective action.

12. Daily Cylinder and Equipment Checklist

VERIFY	EXPECTATION
Identification	Durable label legible; gas/SDS and connection match task
Cylinder condition	No dents, bulges, severe corrosion, heat/arc marks, valve/relief damage, frost or leak
Valve / cap	Valve operable; cap secured when not connected/moving; no unauthorized repair
Restraint	Upright and secured by approved cart/rack/chain/strap; protected from impact/fall
Storage	Oxygen separated 20 ft or compliant barrier; ventilation/combustibles/access acceptable
Placement	Away from sparks, slag, heat, electrical circuit, traffic and falling objects
Regulator / gauges	Correct gas/service; undamaged; adjusting screw/pressure controlled
Hoses / couplings	Correct/distinguishable; no damage/leak; protected route; connections secure
Torch / tip	Valves/couplings/tip sound; proper cleaner and approved lighter available
Protective devices	Correct check valves/flashback arrestors installed and serviceable per manufacturer
Hot-work controls	Permit, extinguisher, fire watch, ventilation/shields and housekeeping ready
Emergency	Valves accessible; wrench where required; evacuation/911/supplier contacts known

PROJECT: _____	DATE / SHIFT: _____
INSPECTOR: _____	GAS / EQUIPMENT: _____
DEFICIENCIES / ACTIONS:	

13. Test Your Knowledge

Circle the best answer. Review missed questions with your foreman before handling or using cylinders.

1. How are cylinder contents identified? A. By color only B. By the durable label/SDS C. By opening the valve	2. How must construction-site cylinders generally be positioned? A. Secured upright B. Flat on the ground C. Leaning loose
3. What separates stored oxygen from fuel gas? A. 5 feet B. A tarp C. 20 feet or compliant 5-foot fire barrier	4. May a valve-protection cap be used for lifting? A. Yes B. No C. Only with rope
5. How far may a fuel-gas valve generally be opened? A. No more than 1-1/2 turns B. Fully open always C. One-quarter turn maximum	6. What belongs on oxygen fittings? A. Grease B. Motor oil C. No oil or grease
7. How are torches lighted? A. Match B. Approved friction lighter/device C. Hot steel	8. What follows a leaking or heat-damaged cylinder? A. Continue carefully B. Field repair C. Stop, isolate and contact supplier/emergency services
9. May oxygen/fuel cylinders enter a confined space? A. No B. Yes if capped C. Only after lunch	10. What is the acetylene pressure limit? A. 100 psig B. Never above 15 psig C. Unlimited

EMPLOYEE: _____

DATE: _____

ANSWER KEY: 1-B | 2-A | 3-C | 4-B | 5-A | 6-C | 7-B | 8-C | 9-A | 10-B