1 Purpose

The purpose of these requirements is to ensure the safe handling and use of compressed gas cylinders (CGCs). They cover handling, use, labeling, and removal. They apply to workers and supervisors.

2 Requirements

The following are the handling and use requirements for compressed gas cylinders (CGCs) throughout their lifecycle at SLAC.

Note: In addition to the following requirements, adhere to the equipment manufacturer’s operating instructions and complete applicable training with an experienced equipment user.

For information on the safe use of gases, see Chemical Safety: Safe Handling Guidelines.

2.1 Before First Use

Before a CGC is used the first time:

- Make sure the CGC is equipped with the correct regulator. Never force connections that do not fit. An improper fit may indicate that the regulator or connector is not suitable.

- Inspect the regulator and CGC valve and remove any grease, oil, dirt, or solvent. Never use grease or oil to lubricate regulators or valves – compressed gas and volatile lubricants can cause an explosion.

- Only use wrenches or tools provided or recommended by the CGC supplier to open or close a valve; never use pliers.

- Place the CGC so that it is easily accessible, does not become part of an electric circuit, and does not become entangled in experimental apparatus.

- Equip CGC discharge lines with approved check valves when connected to a closed system. This prevents inadvertent backflow contamination of cylinders.
2.1.1 Securing CGCs

2.1.1.1 Individual CGCs

- Use appropriate material, such as chain or commercially available straps.
- Use two restraints to secure cylinders that are four or more feet in height. Place one restraint around the cylinder body above the cylinder's center of gravity; place the second restraint around the cylinder body below the cylinder’s center of gravity. (A good rule of thumb is to place the restraints at one third and two thirds the length of the cylinder).
- Smaller cylinders can be secured in cages, ventilated cabinets, or stands.

2.1.1.2 CGCs in Six-unit Stands

- When storing six-unit stands (six-packs), individually secure each gas cylinder to the stand using a single restraint.
- Restrain the stand itself in a cage, or secure it to a wall or to the ground.

2.2 General Use Requirements

- Keep valve protection caps in place until ready to use.
- Close the valve when equipment is not in use.
- Before opening the cylinder valve, back the regulator pressure adjusting screw off to release any spring force.
- Use the cylinder valve, not the regulator, for turning off the gas.
- Close the cylinder valve and release all pressure before removing the regulator.
- Never heat CGCs – even when partially empty – with any device that could raise the surface temperature of the cylinder to above 125º F.
- Keep the cylinder clear of all electrical circuits, flame, and sparks.

2.2.1 Upright and Inverted Use

- CGCs containing flammable liquefied gas (for example, acetylene) must be used valve end up, except those designed for use in a horizontal position and those CGCs containing non-liquefied gases.
- When used upright (inclined no more than 45 degrees from the vertical), the relief device must always be in direct communication with the gas phase.
- If inverted, the CGC must be secured and the dispensing apparatus must be specifically designed for inverted use.

2.3 Empty CGCs

2.3.1 Handling

- Handle empty CGCs with the same care accorded to full CGCs.
- Do not completely empty a cylinder; always leave some residual pressure.
Once a gas cylinder is nearly empty, replace the cap and store it in the compressed gas cylinder storage area, segregated from filled cylinders.

- Label all empty cylinders with tags or write EMPTY or MT along with the date it was emptied using chalk or durable marker. If the CGC has a yellow tag, be sure to tear off the IN SERVICE section to identify the cylinder for removal.
- Mark any unidentifiable cylinder CONTENTS UNKNOWN.
- Do not refill a CGC: only gas suppliers can refill cylinders.

### 2.3.2 Return to Vendor

Once any SLAC-owned or return-to-vendor cylinder is empty, or once the gas in such a cylinder is of no further use, the CGC must be returned to the vendor through chemical management services (CMS). Contact the CMS representative to initiate removal.

*Note*  
CGCs labeled EMPTY with the vendor-supplied yellow tag will be removed automatically.

### 2.3.3 Damaged, Unidentifiable, or Abandoned CGCs

To dispose of any damaged, unidentifiable, or abandoned CGCs, contact the Waste Management (WM) Group.

### 2.4 Tags

CGCs are delivered with a yellow tag, as shown here. If a tag is missing, contact the CMS representative.
Figure 1 CGC Tag

The tag is used to indicate the status of the CGC by tearing off successive tabs. Make sure the tag identifies the status of the cylinder accurately by ripping off the appropriate tab each time the status changes.

- **FULL**
  The original tag, which includes all status options, indicates that no gas has been discharged. If you discharge any gas, be sure to tear off the FULL tab.

- **IN SERVICE**
  IN SERVICE indicates that gas has been discharged. The CGC is ready to be returned to the vendor when a small amount of pressure remains. (Do not discharge completely.) Tear off the IN SERVICE portion of the tag when the pressure is low.

- **EMPTY**
  The cylinder is ready for removal by the gas vendor.

3 Forms

The following are forms required by these requirements:

- None

4 Recordkeeping

The following recordkeeping requirements apply for these requirements:

- None

5 References

**SLAC Environment, Safety, and Health Manual** (SLAC-I-720-0A29Z-001)
- Chapter 40, “Chemical Lifecycle Management”
  - Chemical Lifecycle Management: Management and Use Requirements (SLAC-I-730-0A09S-038)
  - Chemical Lifecycle Management: Chemical Storage Asset Requirements (SLAC-I-730-0A09S-018)
- Chapter 53, “Chemical Safety”
  - Chemical Safety: Hazard Communication Requirements (SLAC-I-730-0A09S-042)
  - Chemical Safety: Safe Handling Guidelines

Other SLAC Documents

- Chemical Management Services (CMS)
- Chemical Procurement – CMS (SharePoint)
Hazard Communication and MSDS References
CMS system

Other Documents
None