

# Compressed Gas Cylinder Storage



*This safety handout was developed to assist you in meeting policy, code, and regulations relating to storage of compressed gas cylinders.*

*Contact the Fort Wainwright Fire Prevention Office for further guidance. 907-353-9134 or 9133, 9140, 9141  
Fire Inspectors: Vockert, Hosier, Chapman, Bryant and Hemmings*

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99703*



*Did you know?  
Compressed gas cylinders can violently rupture and fail in a fire. Safe storage practices must be adhered to.*

A number of different materials are stored in compressed gas cylinders including atmospheric gases, refrigerants and poisonous gases. These gases pose many health and safety hazards which include oxygen displacement, flammability and toxic effects. They also pose physical hazards in the event of a cylinder rupture or explosion. Common compressed gas cylinders found on Fort Wainwright include propane, acetylene, and oxygen to name a few.

## General Requirements for Cylinder Storage

- ◇ Cylinders shall be located to minimize exposure to excessive temperature rises, physical damage, or tampering. Cylinders stored in buildings shall not be located near exits, stairways, or in a required means of egress.
- ◇ Cylinders must be properly secured to prevent tipping, falling, or rolling. They can be properly secured with chains, straps, or bracketed to a fixed surface. Do not use synthetic straps with oxygen.
- ◇ Always place valve protectors on gas cylinders when they are not connected for use.
- ◇ Cylinder contents shall be legibly marked on each cylinder in large letters.
- ◇ Outside storage requires the same protective measures as inside plus a non-combustible canopy to protect cylinders from adverse weather and the sun.
- ◇ Empty cylinders shall be stored upright, closed, with protective caps in place, marked as EMPTY or MT in large letters, and separated from full cylinders.
- ◇ Storage areas shall be free of sources of ignition and smoking is prohibited.
- ◇ Visible hazard identification signs shall be provided for hazardous storage areas or rooms in accordance with NFPA 704.

## Liquid Petroleum Gas (LPG, otherwise known as Propane)

- ◇ LPG tanks must be stored outside, a minimum of 5 feet from exit doors and windows, 10 feet from exit doors which serve as the only exit, and 20 feet from any automotive fuel pump station. Storage areas must be labeled as Flammable Gas.
- ◇ LPG shall not be stored inside an enclosed flammable storage cabinet.
- ◇ All cylinders shall be treated as if they are full if they have ever contained gas.
- ◇ Keep cylinder valve closed whenever not in use.
- ◇ Storage of LPG-powered Material Handling Equipment inside of warehouses requires written authorization. Contact the Fire Prevention office for more info.
- ◇ LPG service stations and storage facilities have additional requirements. Contact the Fire Prevention office for more info.

# FORT WAINWRIGHT FIRE & EMERGENCY SERVICES

## Compressed Gas Storage

REFERENCES AR 420-1

OSHA 1910.110

*Storage and Handling of Liquefied Petroleum Gases*

NFPA 58

*Liquefied Petroleum Gas Code*

NFPA 55

*Compressed Gases and Cryogenics Fluids Code*

UFC 3-600-01

*Fire Protection Engineering for Facilities*

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Office 1049 Chena  
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### Liquid Oxygen (LOX)

- Portable container/LOX cart outdoor storage areas shall be separated from exposure hazards:

Exposure	Min. Distance in ft.
(1) Any building	50
(2) Aircraft parking, fueling, or servicing areas	100
(3) Flammable/combustible liquids handling/storage area	100
(4) Combustible materials (e.g., paper, leaves, debris)	15
(5) Incompatible hazardous materials	20

- LOX storage is not permitted indoors unless all applicable provisions of NFPA 55 are met.

### Gaseous Oxygen (O<sub>2</sub>)

- Shall not be stored within 20 feet of combustible material (especially oil and grease), reserve acetylene cylinders, or other fuel gas cylinders.
- O<sub>2</sub> and acetylene cylinders can be secured on a welding cart with regulator and hoses only when regularly used. If the cart is not used several times a week, the regulators shall be removed and the cylinders properly stored.
- Do not use synthetic straps for securing O<sub>2</sub> cylinders.

### Liquid Carbon Dioxide (CO<sub>2</sub>)

- Beverage systems (more than 100 lbs.) are required to have an area CO<sub>2</sub> alarm or mechanical ventilation if tanks, cylinders, or piping are indoors.
- Small insulated liquid CO<sub>2</sub> indoor systems require a warning sign be posted at the entrance to the building, room, enclosure, or area. Wording is specified in NFPA 55, chapter 13.

### Mixed Storage

- Separation of gas cylinders, containers and tanks shall be in accordance with NFPA 55, Table 7.1.10.2
- The limits in Table 7.1.10.2 shall be permitted to be reduced without limit where there is separation by a barrier of noncombustible construction having a fire resistance rating of at least 0.5 hour and interrupts the line of sight between the containers.
- The distance may be permitted to be reduced to 5 ft where one of the gases is enclosed in a gas cabinet or without limit where both gases are enclosed in gas cabinets.

Table 7.1.10.2 Separation of Gas Cylinders, Containers, and Tanks by Hazard Class

Gas Category	Other Gas	Unstable Reactive Class 2, Class 3, or Class 4		Corrosive		Oxidizing		Flammable		Pyrophoric		Toxic or Highly Toxic	
		ft	m	ft	m	ft	m	ft	m	ft	m	ft	m
Toxic or highly toxic	NR	20	6.1	20	6.1	20	6.1	20	6.1	20	6.1	—	—
Pyrophoric	NR	20	6.1	20	6.1	20	6.1	20	6.1	—	—	20	6.1
Flammable	NR	20	6.1	20	6.1	20	6.1	—	—	20	6.1	20	6.1
Oxidizing	NR	20	6.1	20	6.1	—	—	20	6.1	20	6.1	20	6.1
Corrosive	NR	20	6.1	—	—	20	6.1	20	6.1	20	6.1	20	6.1
Unstable reactive Class 2, Class 3, or Class 4	NR	—	—	20	6.1	20	6.1	20	6.1	20	6.1	20	6.1
Other gas	—	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR

NR: No separation required.