



Storage & Handling of Compressed Gas Cylinders

This safety Fire Net addresses the hazards associated with compressed gas cylinder use and storage. Compressed gas cylinders store gas at very high pressure, up to 2,300 pounds per square inch. If a cylinder or cylinder valve is damaged by falling or by contact with other equipment, the cylinder could act like a projectile and fly through the air or spin in circles with great force until the pressure is exhausted. In addition to the high pressure hazard associated with all compressed gases, the physical properties of the gas within the cylinder may present a particular hazard. Flammable gases can be ignited by the smallest of ignition sources, oxidizing gases can cause ordinary combustible material or even ordinarily non-combustible material to burn hot and bright, and many gases can displace the oxygen in an enclosed space reducing the oxygen concentration below that needed to support human life.

UC Davis EH&S [Safety Net #60, Compressed Gas Safety](#), contains detailed requirements and safety information regarding the use, handling and storage of compressed gases. In addition to the requirements outlined in Safety Net #60, NFPA 101 (Life Safety Code) provides additional requirements for compressed gases used in hospitals and medical office buildings.

Protection from Damage

Cylinders must never be left without some type of physical support or restraint such as a stand, a cart, or a cylinder storage rack.

Quantity Limitations

Gas cylinders are typically found in two sizes, E-Cylinders (capacity: 25 cubic feet) and H-Cylinders (capacity: 250 cubic feet). Compressed gas storage must be limited to 300 cubic feet in each smoke compartment unless the gas is in immediate use by patients or stored in a gas storage room.

- The Joint Commission considers a cylinder in immediate use if it is available to a patient at the bedside, properly secured on a gurney or in an operating room. Cylinders in immediate use need not be included in the 300 cubic foot per smoke compartment limit.
- A gas storage room is an enclosed room accessible to staff only and constructed of non-combustible or limited-combustible materials. Gas cylinders stored in a gas storage room need not be included in the 300 cubic foot per smoke compartment limit. A precautionary sign, readable from a distance of 5 feet, must be displayed on the storage room door. The sign must read as follows: “Caution - Oxidizing Gas Stored Within - No Smoking” (NFPA 99 section 9.4.4).

Oxidizing Gases

Except for cylinders that are in immediate use by patients, cylinders containing oxidizing gases such as oxygen or nitrous oxide must be stored in a gas storage room. Additionally, oxidizing gas cylinders must be maintained a minimum distance of 20 feet from combustible materials. The minimum distance to combustible material may be reduced to 5 feet when the storage room is protected by an automatic fire sprinkler system. This will preclude any combustible storage in the gas storage room if the storage room is too small to achieve the minimum distances (NFPA 99 section 9.4.2).

Regulators, fittings or gauges on oxygen cylinders must never be lubricated with oil or any other flammable substance. Keep all oil, grease or other combustible materials away from oxygen storage equipment.

Transporting Cylinders

H-sized cylinders (250 cubic foot) shall be transported on a hand truck or cart designed for moving cylinders that is self supporting and has a chain or stay to retain the cylinder (NFPA 99 section 5.3.13.2.3). E-sized cylinders (25) cubic feet) are small and may be carried or transported on a cart, but they must always be stored in a rack or stand that provides physical support or restraint to prevent damage to the cylinder.