

OXYGEN STORAGE REQUIREMENTS NFPA 99 – 1999 EDITION LESS THAN 3000 CUBIC FEET

Division of Quality Assurance – Bureau of Regulatory Compliance
(Revised March 2004)

The storage requirements for this section have been completely revised as of 1996 for a variety of reasons. Previously, the requirements in Chapter 8 for the storage of free standing cylinders and containers were referenced with the same requirements in Chapter 4 for storage rooms for piped gas systems. This is still the case for storage of cylinders and containers totaling in excess of 3000 cubic feet. Section 8-3.1.11.2 was created for situations where the total volume in storage is less than 3000 cubic feet. It should also be noted that rooms storing liquid oxygen in any volume shall be required to meet the additional ventilation requirements specified in Chapter 4 due to the fact that these cylinders are constantly venting gas.

8-3.1.11.1 Storage for nonflammable gases greater than 3000 cubic feet shall comply with **4-3.1.1.2** and **4-3.5.2.2**

8-3.1.11.2 Storage for nonflammable gases less than 3000 cubic feet

- (a) Storage locations shall be outdoors in an enclosure or within an enclosed interior space of noncombustible or limited-combustible construction, with doors (or gates outdoors) that can be secured against unauthorized entry.

[Note: Interior doors of storage locations must be equipped with self-closing devices and positive latching hardware to establish the required separation. Door must have at least a ¾ hour fire rating when transferring of liquid oxygen occurs within the storage location. (Explanation added)]

- (b) Oxidizing gases, such as oxygen and nitrous oxide, shall not be stored with any flammable gas liquid or vapor.
- (c) Oxidizing gases such as oxygen and nitrous oxide shall be separated from combustibles or incompatible materials by either:
 1. A minimum distance of 20 ft, or
 2. A minimum distance of 5 ft if the entire storage location is protected by an automatic sprinkler system designed in accordance with NFPA 13, Standard for the Installation of Sprinkler Systems, or
 3. An enclosed cabinet of noncombustible construction having a minimum fire protection rating of one-half hour for cylinder storage. An approved flammable liquid storage cabinet shall be permitted to be used for cylinder storage.



- (d) Liquefied gas container storage shall comply with **4-3.1.1.2(b)4**.

4-3.1.1.2(b)4. Locations for supply systems of more than 3000 ft³ total capacity (connected and in storage) shall be vented to the outside by a dedicated mechanical ventilation system or by natural venting. If natural venting is used, the vent opening or openings shall be a minimum of 72 square inches in total free area.

- (e) Cylinder and container storage locations shall meet **4-3.1.1.2(a)11e** with respect to temperature limitations.

4-3.1.1.2(a)11e Where enclosures (interior or exterior) for supply systems are located near sources of heat, such as furnaces, incinerators, or boiler rooms, they shall be of construction that protects cylinders from reaching temperatures exceeding 130°F (54°C). Open electrical conductors and transformers shall not be located in close proximity to enclosures. Such enclosures shall not be located adjacent to storage tanks for flammable or combustible liquids.

- (f) Electrical fixtures in storage locations shall meet **4-3.1.1.2(a) 11d**.

4-3.1.1.2(a)11d Ordinary electrical wall fixtures in supply rooms shall be installed in fixed locations not less than 5 ft (1.5 m) above the floor to avoid physical damage.

- (g) Cylinder protection from mechanical shock shall meet **4-3.5.2.1(b)13**.

4-3.5.2.1(b)13 Oxygen cylinders shall be protected from abnormal mechanical shock, which is liable to damage the cylinder, valve, or safety device. Such cylinders shall not be stored near elevators, gangways, or in locations where heavy moving objects will strike them or fall on them.

- (h) Cylinder or container restraint shall meet **4-3.5.2.1(b)27**.

4-3.5.2.1(b)27 Freestanding cylinders shall be properly chained or supported in a proper cylinder stand or cart.

- (i) Smoking, open flames, electric heating elements, and other sources of ignition shall be prohibited within storage locations and within 20 ft of outside storage locations.

- (j) Cylinder valve protection caps shall meet **4-3.5.2.1(b)14**.

4-3.5.2.1(b)14 Cylinder-valve protection caps, where provided, shall be kept in place and be hand tightened, except when cylinders are in use or connected for use.

8-3.1.11.3 Signs. A precautionary sign, readable from a distance of 5 ft, shall be conspicuously displayed on each door or gate of the storage room or enclosure. The sign shall include the following wording as a minimum:

**CAUTION
OXIDIZING GAS (ES) STORED WITHIN
NO SMOKING**

Note: Responses to questions are intended to assist providers in their efforts to comply with the Life Safety Code in a general manner. Terms that are used may not be well understood by readers who are unfamiliar with building and fire safety codes. Consultation with qualified fire safety engineers or other qualified professionals is advisable. Compliance with Life Safety Code requirements is determined at the time of a survey.