

Work **Safe!** Bulletin

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Acetylene and Oxygen Cylinders Storage

Acetylene and Oxygen are used as fuel gas for welding, cutting and allied processes. These gases are classified according to Canada Transportation of Dangerous Goods Regulation as Class 2 (Gases).

Acetylene and Oxygen are delivered in cylinders that are under constant pressure. The risk associated to cylinders is due to the high pressure of gasses that are contained in them. Transportation or storage of cylinders shall be undertaken with extreme care.

The Canadian Standards Association latest standard "W117.2-01 Safety in Welding, Cutting, and Allied Processes" focuses on health and safety for welding processes and applications. It addresses specifically to the operator of such equipment, the supervisors and the employer under whose authority such operations are carried out. It also contains specific provisions related to cylinders use.

The National Fire Code of Canada (1995) has specific details on indoor and outdoor storage of acetylene and oxygen cylinders. These specifications are also adopted under the National Building Code of Canada (1995).

Summary of the above mentioned codes and standards requirements for cylinder storage are:

A. General

All cylinders shall be protected against:

- physical and mechanical damage,
- tampering by an unauthorized person,
- valve damages,
- high temperature (above 51.7°C or 125°F).

Oxygen cylinders shall be separated by at least 6 m. (20ft.) distance or by a noncombustible barrier at least 1.5 m. (5ft.) with a fire resistant rating of at least 1/2h from:

- flammable or combustible liquids,
- easy ignited materials (e.g. wood, paper, packing materials),
- oil and grease,
- propane (fuel gas) cylinders ¹,
- reserve stocks of calcium carbide.



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Acetylene and liquefied gas cylinders shall be stored valve end up. The valve shall be closed, with the protective device in place.

B. Indoor storage of compressed class 2 gases cylinders shall be:

Located away from:

- elevators, stairways, gangways, exits or corridors providing exit,
- 1 m. from exit in buildings other than industrial occupancies,
- any fire escape, outside exit stairs, passage or rump.

Oxygen cylinders stored outside acetylene generator houses shall be separated from the generator or carbide storage rooms by a noncombustible partition with a fire resistance rating of at least 1h. This partition shall be without openings and shall be gas tight.

¹ Note: propane cylinders shall be stored outside the building, and only daily used quantities shall be kept indoors.

Cylinders shall be located in a room that is separated from the remainder of the building by a gas-tight fire separation having a fire resistance rating of 2 h (for flammable gases) or 1h (for poisonous, corrosive or oxidizing gases),

- located on the exterior wall of the building,
- have direct access from the exterior of the building,
- equipped with self closing devices,
- constructed in order to prevent migration of gases from the room into other parts of the building,
- provided with natural or mechanical ventilation,
- free of fuel fired appliances or high temperature heating elements,
- used for no purpose other than the storage of Class 2 gases.

For gases lighter than air, storage is permitted outside of a room if:

- in a unsprinklered building of combustible construction, the aggregate capacity of expended gas outside of the room is not more than 60 m.³,
- in a sprinkled building or in a building of noncombustible construction, the aggregate capacity of expended gas outside of the room is not more than 170m³.

C. Outdoor storage of compressed gases shall be:

- Located in an enclosure rounded with a firmly anchored fence that discourages climbing and unauthorized entry, not less than 1.8 m. high and provided with gates that shall be locked when the storage area is not staffed,
- When in the Fire Department route, it should have gates according with the Fire Code provisions.
- For flammable and poisonous or corrosive gases shall be not less than:
 - 1.5 m. from any building opening, if the aggregate capacity of the expanded gas is not more than 170 m.³,
 - 7.5 m. from any building opening, if the aggregate capacity of the expanded gas is more than 170 m.³ but less than 500 m.³,
 - 15 m. from any building opening, if the aggregate capacity of the expanded gas is more than 500 m.³,

* these requirements do not apply when the opening referred to is in a room that has to be designed as an indoor storage area which is used for storing Class 2 gases.