Chapter 8 Compressed and Liquefied Gases

8-1 Compressed and Liquefied Gases in Cylinders.

See Appendix E and Appendix F.

8-1.1

Cylinders shall be handled only by trained personnel. (*See Appendix E and Appendix F*.)

8-1.2*

Cylinders that are not necessary for current laboratory requirements shall be stored in a safe location outside the laboratory work area.

Exception: Nominal 0.5-kg (1-lb) propane cylinders, made for consumer use, shall be exempt from this requirement.

8-1.3* Any compressed gas cylinder or container used at pressures over 103 kPa (15 psig) shall be fabricated to the specifications of or authorized for use by the U.S. Department of Transportation (DOT), Transport Canada (TC), or Section VIII, ASME *Boiler and Pressure Vessel Code*. The container shall be marked to show the authorizing code and its working pressure at 21°C (70°F).

Exception: Vessels whose physical size, operating pressure, or both, are outside the scope of the referenced code(s), shall be constructed in accordance with the philosophy and guidance of the ASME code, and shall not require marking.

8-1.4

Cylinders of all gases having Health Hazard Ratings of 3 or 4 and cylinders of gases having a Health Hazard Rating of 2 with no physiological warning properties shall be kept in a continuously mechanically ventilated hood or other continuously mechanically ventilated enclosure. There shall be no more than three cylinders of gases with Health Hazard Ratings of 3 or 4 per hood or other enclosure. (*See A-8-1.3*.)

8-1.5 Cylinder Safety.

8-1.5.1 Cylinders shall be used safely.

8-1.5.2 Cylinders shall be secured from tipping over by holders designed for such service.

8-1.5.3 Cylinders in the laboratory shall be equipped with a pressure regulator designed and marked for its maximum use pressure.

8-1.5.3.1 The regulator system shall be equipped with two gauges, either on the regulator or remote to the regulator, so installed to show both the cylinder pressure and the outlet pressure.

8-1.5.3.2 Where the source cylinder is outside of the laboratory, a station regulator and gauge shall be installed at the point of use to show outlet pressure.

8-1.5.4 Cylinders shall have a manual shutoff valve. A quick connect shall not be used in place of a shutoff valve. Line regulators that have their source away from the point of use shall have a manual shutoff valve near the point of use.

8-1.6 Cylinders in Use.

8-1.6.1 The number of cylinders in use in the laboratory work area shall comply with Table 8-1. The number of lecture bottle cylinders [approximately 5 cm ? 33 cm (2 in. ? 13 in.)] shall be limited to 25.

Exception: In instructional laboratory units (as defined in this standard), the total number of cylinders shall be reduced to three maximum size cylinders (as defined in this standard) or 10 lecture bottle size [approximately 5 cm ? 33 cm (2 in. ? 13 in.)] cylinders.

Table 8-1 Maximum Number of Compressed or Liquefied

Gas Cylinders in Laboratory Work Areas[1]					
	Flammable or Oxidizing Gases		Liquefied Flammable Gases		Gases with Health Hazard Rating of 3 or 4
	Sprinklered Space	Nonsprinklered Space	Sprinklered Space	Nonsprinklered Space	Sprinklered or Nonsprinklered Space
Max. no. of cylinders per 46.5 m2 (500 ft2) or less	6	3	3	2	3

1See 8-1.6.1 for total cylinders allowed in laboratory work area.

For SI units: 1.0 in. = 0.25 ft2 = 46 m2; 1.0 ft3 = 28.3 L.

8-1.6.2 The total quantity of cylinders (as defined in this standard) of gases allowed within a single laboratory work area shall not exceed the sum total of the limits of each of the three listed categories, for the type of space (sprinklered or nonsprinklered).

8-1.6.3 Cylinders shall be attached to an instrument for use by means of a regulator.

8-1.6.4 Excess cylinders shall not be stored in the laboratory.

8-1.6.5 A compressed gas cylinder shall be considered to be "in use" if it is:

(a) Connected through a regulator to deliver gas to a laboratory operation; or

(b) Connected to a manifold being used to deliver gas to a laboratory operation; or

(c) A single cylinder secured alongside the cylinder in (a) above as the reserve cylinder for (a).