

ENQUIRY DRAFT

Specification for the Storage, handling and transport of steel compressed gas cylinder



Guyana National Bureau of Standards

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Contents

Foreword.....iv

Members of the Technical Committee - Gas Cylindersv

Standard

1 Scope.....1

2 Definitions1

3 Cylinder specification.....1

4 Storage3

5 Handling.....4

6 Transportation.....4

Appendix A6

Foreword

This Guyana Standard was revised by the Technical Committee (TC 29)– Gas Cylinders in 2025.

In the preparation of this standard, information was derived from the following publications:

- (a) **Compressed Gas Association Incorporated, Handbook of Compressed Gases, Third edition, New York; Chapman and Hall, 1990;**
- (b) **Compressed Gas Association Incorporated, Pamphlet C-1 – Methods for Hydrostatic Testing of Compressed Gas Cylinders, Sixth edition, 1991; and**
- (c) **Compressed Gas Association, Incorporated, Pamphlet C-13 – Guidelines on Periodic Visual Inspection and requalification of Acetylene Cylinders, Third edition, 1992.**

This standard was developed to establish requirements for the safe use and storage of steel compressed gas cylinders and is intended to be made compulsory.

Members of the Technical Committee -Gas Cylinders

ENQUIRY DRAFT

Specification for the Storage, handling and transport of steel compressed gas cylinders

1 Scope

This standard specifies the minimum requirements for the storage, handling and vehicular transport of steel high pressure compressed gas cylinders and acetylene.

This standard does not cover the storage, handling and transport of ammonia cylinders.

2 Definitions

For the purpose of this standard, the following definitions shall apply:

2.1 compressed gases

Any material or mixture having in the container or absolute pressure exceeding 40 PSI at 21.1°C , having an absolute pressure exceeding 10 PSI at 54.4°C , or any liquid material having a vapour exceeding 40 PSI absolute at 37.8°C, as determined by **ASTM Test D-323 "Standard test method for vapor pressure of petroleum products" (Reid Method)**.

2.2 CGA

Compressed Gas Association.

2.3 cylinder

A portable container designed and constructed to contain compressed gases with a water capacity of 454kg Department of Transportation (DOT).

2.4 DOT

Department of Transportation.

2.5 nesting

A three point contact system where cylinders are in contact at three points; either with a secure wall or with another cylinder (See Appendix A).

3 Cylinder specification

3.1 Containers specifications

Cylinders shall conform to the following specifications and any other internationally recognised standards and be stamped to indicate such:

- (a) DOT -3A;
- (b) DOT -3AA;

- (c) DOT -8; or
- (d) DOT -8AL.

NOTE 1 In cases where the above specifications are not met, a service pressure of 176 kg/cm^2 (250 PSIPSI) is used for acetylene cylinders and 127 kg/cm^2 (1800 PSI) for high pressure cylinders or more which shall be clearly marked by the manufacturer on the cylinder.

3.2 Cylinder markings

Cylinders shall be clearly marked with the following information:

- (a) The specification under which they are made;
- (b) The service pressure for which they are designed;
- (c) A serial number of the manufacturer;
- (d) A symbol of the manufacturer;
- (e) Date of manufacture or last test date; and
- (f) A tester's symbol.

3.3 Connections and appurtenances

Cylinders shall be fitted with the following connections and appurtenances:

- (a) A necking to facilitate the proper fitting of the cylinder cap of the cylinder;
- (b) A cylinder valve for filling and withdrawal of gas from the cylinder; and
- (c) A safety relief device that is designed to relieve pressure build up in cylinders.

3.4 Cylinder body

The body of the cylinder shall not have:

- (a) sharp dents or cuts;
- (b) dents on welds;
- (c) evidence of exposure to fire or excessive heat;
- (d) bulging;
- (e) corrosion pitting; and
- (f) corrosion that could weaken the cylinder wall.

3.5 Cylinder repairs

Repairs or replacement of non-pressure parts of the cylinder such as the foot and neck rings shall be done only if welding or excess heat is not applied to the pressure bearing part of the cylinder.

3.6 Cylinder requalification

Cylinders shall be requalified periodically according to the following intervals:

- (a) Every 10 years if the retest marking has a star (*); and
- (b) Every 5 years if the retest marking has no star.

3.7 Water jacket type hydrostatic test

3.7.1 Test pressures of 236.3 kg/cm² (3360 PSI) for 3AA2015, 265.5 kg/cm² (3775 PSI) for 3AA2265 and 281 kg/cm² (4000 PSI) for 3AAA2400 cylinders are used in the hydrostatic testing of the high pressure cylinders. The total expansion of the cylinder during the application of the test pressure shall be observed and recorded for comparison with the permanent expansion of the cylinder after depressurisation.

3.7.2 Cylinders that passed the retest are marked with the month and year (e.g. August, 2004).

3.7.3 Cylinders that have a permanent expansion exceeding 10% of the total expansion shall be rejected.

NOTE 2 This does not apply to acetylene cylinders.

4 Storage

The following requirements shall be observed:

- (a) Cylinders shall be stored in a well ventilated area and shall not be subjected to ignition sources or ambient temperatures above 125 °F (51.7 °C). They shall be stored and secured in an upright position and shall not be exposed to continuous dampness, salt or other corrosive chemicals or fumes. Corrosion can damage cylinders and cause their valve protection to stick;
- (b) Cylinders shall be placed in a location where they will not be subjected to mechanical or physical damage and shall not be left unattended in hallways, corridors, stairways or other areas of access and egress;
- (c) The names of the gases stored in appropriately selected areas shall be prominently posted. Flammable gases shall be stored separately from oxidising gases. A minimum distance of 6.1m or noncombustible barrier at least 1.5m high having a fire resistance of at least one and a half hour, shall separate these gases. A CGA shoulder decal shall be used to identify cylinder contents;
- (d) The cylinder storage areas shall be marked with cautionary signs, such as **‘Storage of Flammable, Oxidiser or Toxic Materials;’**
- (e) Where removable caps are provided for valve protection, the user shall keep such caps on the containers at all times, except at time of filling or withdrawal or gas from the cylinder;
- (g) When empty cylinders are to be returned to the vendor, they shall be marked **“Empty” or “MT”**. Empty cylinders shall be segregated from full cylinders. and stored and handled in the same manner as filled cylinders.

(h) All compressed gas cylinders in service or in storage at the user's location shall be secured to prevent falling. At gas manufacturers' facilities and distributors' storage houses, the nesting of cylinders shall be the method of storage. (See Appendix A). In seismically active areas, additional measures shall be required to prevent cylinders from falling in storage.

NOTE 3 Before the storage of compressed gas cylinders at any bond or storage house, the Guyana Fire Service Department shall be consulted to inspect the proposed site of storage.

5 Handling

Compressed gas cylinders shall:

- (a) not be rolled on their sides but shall be rolled on their foot rings or bottom;
- (b) be handled in a manner that minimises damage to valves, foot rings and caps; and
- (c) not be rolled, dropped, slid or allowed to come in contact with sharp objects. They shall not be exposed to fire or flames from welding torches.

5.2 Cylinder filling

Compressed gas cylinders shall be filled only by the owners, provided that the owners conduct/establish an authorised business. In circumstances where the owner of a cylinder does not conduct an authorised compressed gas business, a cylinder shall be filled after permission of the owner of an authorised compressed gas business is given.

6 Transportation

6.1 In the process of transportation of cylinders, the following shall be observed:

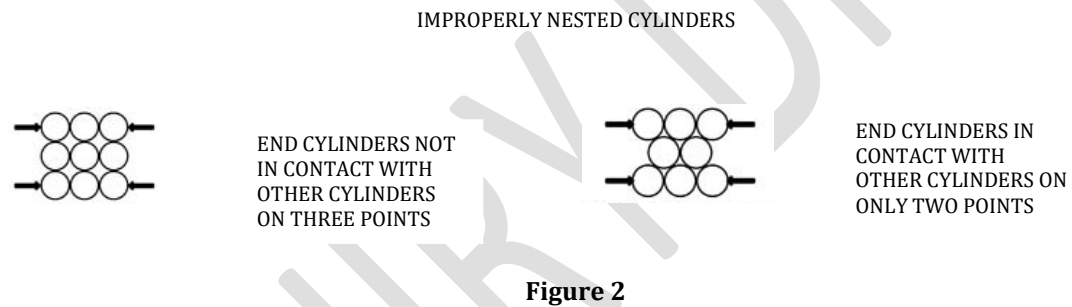
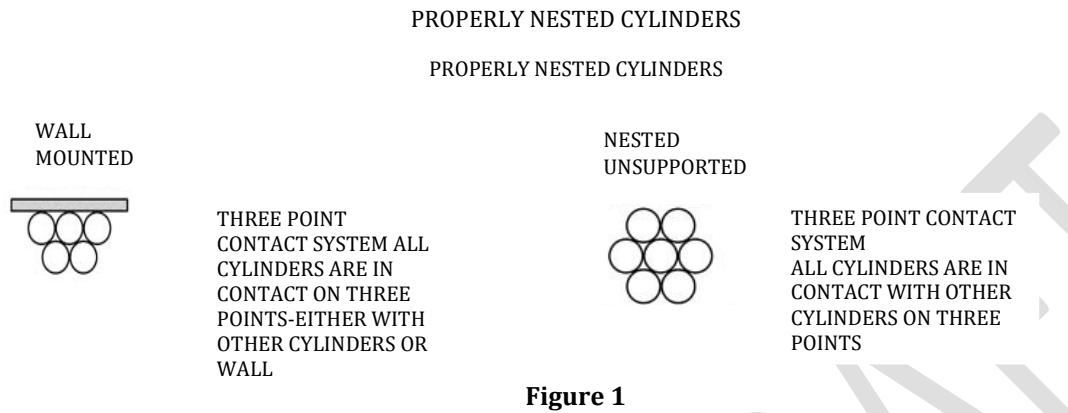
- (a) Vehicles shall not be loaded above the gross vehicle weight;
- (b) Cylinders shall be determined leak free before loading into vehicles;
- (c) The cargo space in which the cylinders are stored shall be isolated from the driver's compartment, the engine and the exhaust system;
- (d) Cylinders shall be transported in open bodied vehicles. They shall be fastened securely in an upright position, minimising the possibility of movement, tipping or physical damage either to themselves or the supporting structure. The resistant used shall take into consideration movement that may arise from braking and acceleration forces;
- (e) Cylinders shall not be dropped or thrown onto or off the vehicles, or rolled horizontally along the ground;
- (f) Each vehicle shall be equipped with at least one approved portable fire extinguisher having a minimum capacity of 9 kg dry chemical with a B:C rating;
- (g) Only one cylinder shall be handled or moved at a time;

- (h) The cover cap shall be screwed on tight and remain on for valve protection during transportation until the cylinder is in place and ready to use;
- (i) Cylinders shall not be transported with the regulator attached to the cylinder;
- (j) Vehicles transporting gas shall have a sign indicating the name of the gas being transported. The size of the letters indicating the name of the gas being transported shall have a minimum of 5.08 cm height. The letters of the name of the gas transported shall be black with white background; and
- (k) No compressed gas shall be transported in a cylinder, which is not properly labelled as specified in CGA P 15: 2016 – Standard for The Filling of Industrial and Medical Non-flammable Compressed Gas Cylinders.
- (l) Cylinders shall not be transported via passenger aircraft. Air transportation may be allowed with approval and authorisation from the Guyana Civil Aviation Authority (GCAA).
- (m) Empty cylinders shall be transported in the same manner as filled containers.

NOTE 4 Cylinders that contain compressed gases are primarily shipping containers and shall not be subjected to rough handling or abuse. Such misuse can seriously weaken the cylinder and render it unfit for further use or can transform it into a rocket having sufficient thrust to drive it through masonry walls.

Appendix A

A.1 Cylinder nesting



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