

HSSE Regulatory Update



Guidelines for Industrial Gas Cylinder (Design, Construction, Handling, Inspection and Testing) 2021

Summary

The purpose of these guidelines was to provide advice and guidance to any individual or organization involved in the design, construction, operation and handling, inspection, testing and disposal of compressed gas cylinders with a water capacity of 0.5 to 150 litre.

These guidelines were created as an additional support for securing the safety, health and welfare of persons as described in Occupational Safety and Health Act 1994 (OSHA 1994) and Factories and Machinery Act (FMA 1967). Gas cylinders are defined under FMA as steel cylinder or bottles used for the storage and transport of compressed, dissolved or liquified gases, also defined as a machinery. Section 3 of OSHA includes cylinders as 'plant' and gas as 'substance'.

The guidelines do not apply to:

- Cylinders forming part of vehicle e.g. NGV cylinder
- Aerosol containers and gas cartridges
- Non-refillable cylinders
- Fire extinguisher
- LPG cylinders

For specific gas applications such as welding, diving, inerting, etc., there are additional requirements applicable which are not covered in the guidelines.

Basic Info & Links

Agency: Department of Occupational Safety and Health (DOSH)

Full text of the Guidelines:

<https://www.dosh.gov.my/index.php/legislation/guidelines/industrial-safety/4002-guidelines-for-industrial-gas-cylinder-design-construction-handling-inspection-and-testing-2021/file>

Full text of Factories and Machinery Act (FMA 1967) [Act 139] and Occupational Safety and Health Act 1994 (OSHA 1994) [Act 514]:

<https://www.dosh.gov.my/index.php/legislation/acts-legislation>

Review/ Q&A

What is the design and construction standard of a compressed gas cylinder?

The cylinders shall be designed and manufactured in accordance to the current cylinder standard but not limited to the standards as listed below:

- i) National Standards such as MS 2542:2013 Gas Cylinder Package [excluding liquified petroleum gases (LPG) and firefighting] – Code of Practice and International Standards issued by International Organization for Standardization (ISO), European Committee for Standardization (CEN), Transportation Canada (TC) or United States Department of Transport (DOT).
- ii) Other national standards, subject to the following requirements:
 - a) The standard applies to the manufacture of cylinder in the country of origin
 - b) The standard contains equivalent requirements to a standard listed in item (a) for material composition, properties and testing, method of manufacture, testing including type-testing and examination, rejection criteria, marking, documentation and quality assurance.

The Guidelines also highlight additional requirements for the construction of closed cryogenic receptacles and cylinders for acetylene. The conformity of cylinders shall be assessed at time of manufacture as required by the standards or codes, by an inspecting authority.

What are the safety requirements highlighted in the Guidelines?

The Guidelines describe the primary safety mechanisms on a gas cylinder that shall not be tampered with, including gas cylinder valve, valve protection (valve guard, valve shroud, valve protection cap), valve outlets, valve with dip tube, regulator, and pressure relief devices (burst disc, fusible plug, pressure relief valves), and the operations of these devices.

Cylinders and their contents should be identified for clear benefits of all users, fillers, periodic testers, transporters, emergency responders and any person coming into contact with the cylinder and/ or its contents. The cylinder identification (manufacture, standards, test dates, approval number, etc.) and valves and fittings identification should be stamped or permanently marked in the cylinder. Gas identification, user warning and filling station identification can be mark using adhesive or attached labels. The labelling shall be in accordance with the National Occupational Safety and Health Regulation (Chemical Classification, Labelling and Safety Data Sheets) 2013, OSHA 1994.

The cylinder(s) should be supported in bins, racks or in a customised supporting “cradles” or chocks that are designed to prevent the cylinder(s) from rolling or restrained in the upright attitude by way of a tie-down straps or ropes.

Flammables and toxic gas cylinders should not be stored in the same compartment or in the same part of the vehicle as the driver or passengers.

What are the requirements and standards that may apply in filling a cylinder?

The employers must ensure that:

- a) All persons filling the cylinders are trained for gas traffic and cylinder types
- b) All equipment necessary to safely fill cylinders is provided and well maintained
- c) The cylinder filling and storage areas are separated by the required distances and are kept orderly and tidy.

The following standards are to be followed:

- i) ISO 24431:2016 Gas Cylinder – Seamless, Welded and composite Cylinders for Compressed and Liquefied Gases (Excluding Acetylene) – Inspection at Time of Filling
- ii) ISO 11755:2005 Gas Cylinders – Cylinder Bundles for compressed and liquefied Gases (excluding Acetylene) Inspection of Time of Filling
- iii) MS 2239:2009 (CONFIRMED:2015) Gas Cylinders – Cylinders for compressed and liquefied gases (excluding Acetylene) – Inspection at time of filling (ISO 24431:2006, MOD) (First revision).

When will a gas cylinder require requalification?

Provided that the cylinder has been subjected to normal conditions of use and has not been subjected to abusive and abnormal conditions that would render the cylinder unsafe, there is no general requirement for the user to return a gas cylinder before the contents have been used even though the periodic inspection and test interval may have lapsed. However, no cylinder shall be refilled beyond the expiry date of requalification.

For compressed gases service, the United Nations recommended period for requalification of 5-year interval. A 10-year interval may be used if the dryness of the product and that of the filled cylinder are such that there is no free water. Under certain conditions, a shorter time interval for requalification may be required at all times, e.g. the dew point of the gas, polymerization reactions and decomposition reactions, cylinder design specifications, change of gas service, etc.

What are the steps in cylinder disposal?

Cylinder disposal steps are as follows:

- 1) Release the gas content contained in the cylinder in a safe manner;*
 - 2) Removing the valve located on the cylinder*
 - 3) Make sure there is no gas in the cylinder*
 - 4) The thread neck cylinder shall be completely damaged and shall not be used again;*
 - 5) Cylinder must be cut and destroyed; and*
 - 6) For acetylene cylinders, refer AIGA 036/16 - Revision of AIGA 036/06, Asia Industrial Gases Association (Guidelines for the Management of Waste Acetylene Cylinder) or other relevant international standards.*
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