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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 14193.1-2025

Replacing GB/T 14193-2009

**Rules for filling of liquefied gas cylinders - Part 1: Industrial gas
cylinders**

液化气体气瓶充装规定 第1部分：工业气瓶

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Table of Contents

- 1 Scope
- 2 Normative References
- 3 Terms and Definitions
- 4 Basic Conditions
- 5 Filling Process Control
 - 5.1 Pre-filling Inspection and Handling
 - 5.1.2 Post-inspection handling
 - 5.1.2.1 Gas cylinders that do not meet the requirements of
- 6 Filling Ratios and Filling Quantities...
- 7 Filling Records...

1 Scope

GB/T 14193.1-2025 is the Chinese national standard on rules for filling of liquefied gas cylinders - part 1: industrial gas cylinders, in the field of fluid systems and general-purpose components. The /T suffix marks it as a recommended standard: it is not compulsory by itself, but it becomes binding as soon as a contract, a tender or a customer specification calls it up - which in practice is how most foreign buyers meet it. It was issued on 29 August 2025 by the State Administration for Market Regulation; Standardization Administration of China, and has been in force since 1 March 2026. Classification: ICS 23.020.30, CCS J74. This page is published from the official record of the standard held by the Chinese standards administration: the identification, the dates, the classification and the issuing body are taken from there. The clause text, the tables and the numeric limits are in the document itself, which is delivered complete in English translation.

This document specifies the basic conditions, filling process control, filling ratios and filling quantities, filling records, and filling quality and safety traceability information system for filling industrial gas cylinders with liquefied gases (hereinafter referred to as the "gas cylinders"). This document applies to the filling of high-pressure liquefied gas cylinders and low-pressure liquefied gas cylinders with a saturated vapor pressure of not less than

0.1 MPa (gauge pressure) at the gas cylinders' maximum operating temperature. This document does not apply to the filling of vehicle-mounted gas cylinders, fuel gas cylinders or fire-fighting gas cylinders.

2 Normative References

The contents of the following documents constitute indispensable clauses of this document through the normative references in the text. In terms of references with a specified date, only versions with a specified date are applicable to this document. In terms of references without a specified date, the latest version (including all the modifications) is applicable to this document.

GB/T 3836.1 Explosive Atmospheres - Part

3 Terms and Definitions

The terms and definitions defined in GB/T 13005, and the following are applicable to this document.

3.1 industrial gas cylinders Gas cylinders other than fuel gas cylinders, vehicle-mounted gas cylinders and fire-fighting gas cylinders.

3.2 remaining pressure The pressure of the gas remaining in the gas cylinder before filling.

4 Basic Conditions

4.1 The filling organizations shall meet the licensing conditions of TSG 07.

4.2 The filling organizations shall establish and maintain the filling quality and safety traceability information system.

4.3 The filling organizations shall maintain electronic tags or QR codes or other electronic identification marks on registered gas cylinders in accordance with the requirements of TSG

23. Gas cylinders that cannot be electronically identified shall not be filled. The electronic identification marks shall have encryption and anti-counterfeiting functions.

4.4 The filling organizations shall be equipped with trained and qualified operation personnel.

4.5 Special equipment used by the filling organizations shall comply with the special equipment safety technical specifications, and electronic files shall be established for the gas cylinders to be filled, and usage registration shall be completed.

4.6 Hazardous concentration monitoring and alarm devices shall be installed in areas where flammable, toxic or corrosive gases accumulate, and be regularly calibrated. The filling system shall have interlocking shut-off devices.

4.7 Filling equipment shall have overfill alarm or automatic shut-off functions. Weighing instruments shall be kept accurate, and their precision shall meet the technical requirements of the products to be filled. Weighing instruments shall be regularly verified or calibrated, with a verification or calibration cycle not exceeding one year. During filling

activities, weighing instruments shall be routinely re-checked with weights before each day's use. Filling stations shall be equipped with dedicated weighing instruments for re-checking and be regularly verified or calibrated in accordance with the requirements of metrological regulations.

4.8 Stationary pressure vessels storing liquefied gases shall comply with the provisions of TSG 21 and shall be equipped with accurate and safe liquid level display devices and overfill prevention facilities. The storage pressure of stationary pressure vessels storing carbon dioxide shall not be lower than

1.0 MPa. Furthermore, the pressure and liquid level display devices set up by the storage containers shall have remote transmission function.

4.9 Filling equipment in explosion-proof areas shall comply with the requirements of GB/T 3836.1.

4.10 The filling equipment and facilities systems, metering equipment, safety facilities, and monitoring devices of the filling organizations shall be suitable for the type of gas, its hazardous characteristics, and the filling quantities, and shall have intact functions and comply with the safety technical specifications and relevant standards.

4.11 The filling organizations shall be equipped with instruments that can satisfy product quality analysis.

4.12 Filling operators shall be familiar with the chemical and physical properties of the medium being filled, safety protection measures, and its compatibility with the gas cylinder material. The compatibility of commonly used liquefied gases with metallic materials is given in Appendix A.

5.1 Pre-filling Inspection and Handling

5.1.1 Pre-filling inspection Pre-filling inspection of each gas cylinder shall be conducted by designated personnel. The inspection shall include at least the following contents.

- a) Whether the gas cylinder was manufactured by an organization with a "Special Equipment Production License";
- b) Whether the gas being filled is consistent with the name or chemical formula of the gas as stamped on the cylinder's manufacturing mark;
- c) Whether the gas cylinder is a registered cylinder for use at the current filling station and has been approved for filling by the registration authority;
- d) Whether the color markings on the outer surface of the gas cylinder comply with the provisions of GB/T 7144 and are clear and easily identifiable;
- e) Whether the thread type of the cylinder valve's gas outlet complies with the provisions of GB/T 15383;

- f) Whether the outer surface of the gas cylinder is free of cracks, severe corrosion, obvious deformation, and other serious external damage defects;
- g) Whether the gas cylinder is within its specified design service life, or the extended service life is approved by the safety assessment;
- h) Whether the gas cylinder is within its specified inspection validity period;
- i) Whether the gas cylinder accessories are complete and meet the requirements for safe operation;
- j) Whether there is remaining pressure in the gas cylinder, and whether the medium inside the gas cylinder is consistent with the medium being filled;
- k) Whether the valve and cylinder body of oxidizing gases are free of grease;
- l) Whether the cylinder body or accessory materials are compatible with the nature of the medium being filled.

5.1.2.1 Gas cylinders that do not meet the requirements of

5.1.1 shall not be filled.

5.1.2.2 If, during the inspection, the oxygen content in flammable liquefied gas is found to exceed 2% (volume fraction), filling shall not be carried out, and the cause shall be found out, and the gas cylinder shall be properly handled.

5.1.2.3 The quality of the gas to be filled shall meet the quality requirements of the corresponding gas product; otherwise, filling shall not be carried out.

5.1.2.4 Gas cylinders whose color or other markings, or whose valve outlet thread does not conform to the specifications for the gas being filled, shall not be filled, and the cause shall be found out, and the gas cylinder shall be properly handled.

5.1.2.5 Before filling, gas cylinders with no remaining pressure, newly put into use, or being filled for the first time after inspection shall be vacuumed, dried, or replaced to remove air and moisture in the cylinders. Filling shall only proceed after these requirements are met.

5.1.2.6 When significant defects are found during appearance inspection or if there is doubt about their internal condition, gas cylinders within their inspection validity period shall be sent to a gas cylinder inspection institution for technical inspection and safety assessment in accordance with regulations. Only cylinders that pass the inspection can be re-used. Gas cylinders in stock and discontinued gas cylinders exceeding their inspection cycle shall undergo periodic inspection before being put into use.

5.1.2.7 Gas cylinders that fail the inspection (including those awaiting handling) shall be separately stored from qualified cylinders and clearly marked to prevent confusion.