

ICS 71.100.20
CCS G 86



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

GB/T 3634.2-2025

Replacing GB/T 3634.2-2011

**Hydrogen - Part 2: Pure hydrogen, high purity hydrogen and
ultra purity hydrogen**

氢气 第2部分：纯氢、高纯氢和超纯氢

Issued on: October 31, 2025

Implemented on: May 1, 2026

**Issued by: State Administration for Market Regulation;
Standardization Administration of the PRC**

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1 Scope

GB/T 3634.2-2025 is the Chinese national standard covering the three high grades of hydrogen - the impurity limits down to parts per billion for the ultra pure grade used in semiconductor processing, the analytical methods capable of measuring at that level, and the packaging and handling. Part 2 of the series. It replaces GB/T 3634.2-2011, in force from 1 May 2026. Issued on 31 October 2025, it has been in force since 1 May 2026, replacing GB/T 3634.2-2011.

This document specifies the technical requirements, sampling, inspection rules, marking, packaging, transportation and storage requirements for pure hydrogen, high purity hydrogen and ultra purity hydrogen, describes the corresponding test methods, and provides safety information for pure hydrogen, high purity hydrogen and ultra purity hydrogen. This document applies to pure hydrogen, high-purity hydrogen, and ultra-purity hydrogen produced from fossil fuel conversion, chemical cracking, industrial by- product hydrogen, hydrogen compressed natural gas through separation and purification, and water electrolysis.

2 Normative references

The provisions of the following documents constitute the essential clauses of this document through normative references in this text. Among them, for any dated reference, only the version corresponding to that date applies to this document; for any undated reference, the latest version (including all amendments) applies to this document.

GB 190 Packing symbol of dangerous goods

GB/T 3634.1 Hydrogen - Part

3 The method of cavity ring-down spectroscopy

GB/T 6285 Determination of trace oxygen in gases - Electrochemical method

GB/T 7144 Coloured cylinder mark for gases

GB/T 8984 Gas analysis - Determination of the contents of trace carbon monoxide, carbon dioxide and hydrocarbon in gases - Gas chromatography with flame ionization detector

GB/T 11640 Seamless aluminum alloy gas cylinders

GB/T 14194 Rules for filling of compressed gas cylinders

GB 15258 General rules for preparation of precautionary label for chemicals

GB/T 16804 Precautionary labels for gas cylinders

GB/T 28726 Gas analysis - Gas chromatograph with helium ionization detector

GB/T 28727 Gas analysis - Determination of the contents of trace sulfur compounds in gases - Gas chromatography with flame photometric detector

GB/T 33145 Large capacity seamless steel gas cylinders

GB/T 34528 Regulation for filling of cylinder bundle

GB/T 37182 Gas analysis - Gas chromatograph with plasma emission detector

GB/T 43306 Gas analysis - Sampling guidelines TSG

23 Regulation on Safety Technology for Gas Cylinder TSG R0005 Supervision Regulations on Safety Technology for Transportable Pressure Vessel

4 Technical requirements

The technical requirements for pure hydrogen, high-purity hydrogen, and ultra-purity hydrogen shall comply with the provisions of Table 1.

5 Sampling

Sampling of pure hydrogen, high-purity hydrogen and ultra-purity hydrogen shall comply with the provisions of GB/T 43306.

6 Test methods

WARNING -- During the measurement, hydrogen exhaust gas treatment measures shall be in place to prevent the safety risks associated with hydrogen.

6.1 Purity of pure hydrogen, high-purity hydrogen, and ultra-purity hydrogen

6.1.1 Total impurity content The total impurity content is calculated according to formula (1). where x_1 -- oxygen content (mole fraction); x_2 -- nitrogen content (mole fraction); x_3 -- carbon monoxide content (mole fraction); x_4 -- carbon dioxide content (mole fraction); x_5 -- total hydrocarbon content (mole fraction); x_6 -- moisture content (mole fraction); x_7 -- total impurity content (mole fraction).

6.1.2 Purity calculation of pure hydrogen, high-purity hydrogen, and ultra-purity hydrogen The purity of pure hydrogen, high-purity hydrogen, and ultra-purity hydrogen is calculated according to formula (2). where x -- purity (mole fraction) of pure hydrogen, high-purity hydrogen, and ultra-purity hydrogen.

6.2 Determination of the contents of oxygen, argon, nitrogen, carbon monoxide, and carbon dioxide

6.2.1 Determination method

6.2.1.1 The oxygen content is determined according to the method specified in GB/T 6285.

6.2.1.2 The contents of argon, nitrogen, carbon monoxide and carbon dioxide are determined according to the method specified in GB/T 28726.

6.2.1.3 The contents of oxygen, argon, nitrogen, carbon monoxide and carbon dioxide may be determined by other equivalent methods specified in 6.2.2. When there is any objection to the determination result of oxygen content, the method specified in GB/T 6285 shall be the arbitration method. When there is any objection to the determination result of argon, nitrogen, carbon monoxide and carbon dioxide content, the method specified in GB/T 28726 shall be the arbitration method.

6.2.2 Other equivalent determination methods

6.2.2.1 The contents of oxygen, argon, nitrogen, carbon monoxide and carbon dioxide are determined according to the method specified in GB/T 37182.

6.2.2.2 The contents of carbon monoxide and carbon dioxide are determined according to the method specified in GB/T 8984.

6.2.2.3 The oxygen content is determined according to the method specified in GB/T 28726.