

Translated English of Chinese Standard: GB18047-2017

www.ChineseStandard.net → Buy True-PDF → Auto-delivery.

Sales@ChineseStandard.net

GB

NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

ICS 75.060

E 24

GB 18047-2017

Replacing GB 18047-2000

Compressed natural gas as vehicle fuel

G 18047-2017 How to BUY & immediately GET a full-copy of this standard?

1. www.ChineseStandard.net;
2. Search --> Add to Cart --> Checkout (3-steps);
3. No action is required - Full-copy of this standard will be automatically & immediately delivered to your EMAIL address in 0~60 minutes.
4. Support: Sales@ChineseStandard.net. Wayne, Sales manager

Issued on: September 7, 2017

Implemented on: April 1, 2018

Issued by: General Administration of Quality Supervision, Inspection and Quarantine of the PRC;

Standardization Administration of the PRC.

Table of Contents

Foreword.....	3
1 Scope	4
2 Normative references	4
3 Terms and definitions	5
4 Technical requirements and test methods	6
5 Storage and use	7
6 Inspection	8
Appendix A (Informative) Calculation method of methane number	9
Appendix B (Informative) Gas categories of compressed natural gas	11

Foreword

Article 4.1 of this Standard is mandatory. The rest are recommendatory.

This Standard is drafted in accordance with the rules given in GB/T 1.1-2009.

This Standard replaces GB 18047-2000 “Compressed natural gas as vehicle fuel”. As compared with GB 18047-2000, the main changes of this Standard are as follows:

- REVISE technical specifications for total sulfur. It is changed from “not more than 200 mg/m³” to “not more than 100 mg/m³” (SEE Table 1);
- REVISE technical specifications for water dew point. The minimum requirement that “under the maximum operating pressure, the water dew point shall be not higher than -13 °C” is changed to “the mass concentration of water shall not be more than 30 mg/m³”, which is recommended in ISO 15403-2:2006;
- ADD test methods for various indicators and POINT out arbitration methods at the same time;
- MODIFY the gas categories in Appendix B; MODIFY the indicators for 10T and 12T gas; CANCEL 13T gas.

This Standard shall be under the jurisdiction of China National Gas Standardization Technology Committee (SAC/TC 244).

Drafting organizations of this Standard: PetroChina Southwest Oil & Gasfield Branch Natural Gas Research Institute, North China Municipal Engineering Design & Research Institute Co., Ltd., China Petroleum Engineering & Construction Corp East China Design Branch, China National Offshore Oil Corporation Research Institute.

Main drafters of this Standard: Tang Meng, Wu Hongsong, Chi Yongjie, Zhang Yanxia, He Bin, He Yongming, Cui Dechun, Li Shengshan.

The previous release of version of the standard replaced by this Standard is:

- GB 18047-2000.

Compressed natural gas as vehicle fuel

1 Scope

This Standard specifies the technical requirements and test methods of compressed natural gas as vehicle fuel.

This Standard applies to the compressed natural gas of which the pressure is not more than 25 MPa as vehicle fuel.

2 Normative references

The following documents are essential to the application of this document. For the dated references, only the versions with the dates indicated are applicable to this document. For the undated references, the latest version (including all the amendments) are applicable to this document.

GB/T 11060.1 Natural gas - Determination of sulfur compound - Part 1: Determination of hydrogen sulfide content by iodometric titration method

GB/T 11060.2 Natural gas - Determination of Sulfur Compound - Part 2: Determination of Hydrogen Sulfide Content by Methylene Blue Method

GB/T 11060.3 Natural gas - Determination of sulfur compound - Part 3: Determination of hydrogen sulfide content by lead acetate reaction rate dual photo path method

GB/T 11060.4 Natural gas - Determination of sulfur compound - Part 4: Determination of total sulfur content by oxidative microcoulometry method

GB/T 11060.5 Natural gas - Determination of sulfur compound - Part 5: Determination of total sulfur content by hydrogenolysis and rateometric colorimetry method

GB/T 11060.7 Natural gas - Determination of sulfur compounds - Part 7: Determination of total sulfur content by Lingener combustion method

GB/T 11060.8 Natural gas - Determination of sulfur compound - Part 8: Determination of total sulfur content by Ultraviolet fluorescence method

GB/T 11062 Natural gas - Calculation of calorific values, density, relative density and Wobbe index from composition

GB/T 13609 Natural gas sampling guidelines

GB/T 13610 Analysis of natural gas by gas chromatography

GB/T 13611-2006 Classification and essential property of city gas

GB/T 17258 Steel cylinders for the on-board storage of compressed natural gas as a fuel for automotive vehicles

GB/T 17283 Determination of the water dew point of natural gas - Cooled surface condensation hygrometers

GB/T 18619.1 Natural gas - Determination of water by the Karl Fischer method-Coulometric procedure

GB/T 19158 Steel cylinders for the storage of compressed natural gas

GB/T 21069 Natural gas - Determination of water content at high pressure

GB/T 22634 Conversion between water content and water dew point of natural gas

GB/T 27894.3 Natural gas - Determination of composition with defined uncertainty by gas chromatography - Part 3: Determination of hydrogen, helium, oxygen, nitrogen, carbon dioxide and hydrocarbons up to C8 using two packed columns

GB/T 27894.4 Natural gas - Determination of composition with defined uncertainty by gas chromatography - Part 4: Determination of nitrogen, carbon dioxide and C1 to C5 and C6+ hydrocarbons for a laboratory and on-line measuring system using two columns

GB/T 27894.5 Natural gas - Determination of composition with defined uncertainty by gas chromatography - Part 5: Determination of nitrogen, carbon dioxide and C1 to C5 and C6+ hydrocarbons for a laboratory and on-line process application using three columns

GB/T 27894.6 Natural gas - Determination of composition with defined uncertainty by gas chromatography - Part 6: Determination of hydrogen helium oxygen nitrogen carbon dioxide and C1 to C8 hydrocarbons using three capillary columns

GB/T 27896 Test method for water vapor content of natural gas using - Electronic moisture analyzers

TSGR 0004 Supervision Regulation on Safety Technology for Stationary Pressure Vessel

3 Terms and definitions

4.2 The calculation of the higher heating value of compressed natural gas as vehicle fuel shall be carried out according to GB/T 11062. The determination of the composition of natural gas on which it is based shall be carried out according to GB/T 13610, GB/T 27894.3, GB/T 27894.4, GB/T 27894.5, or GB/T 27894.6. The arbitration test method is GB/T 13610.

4.3 The determination of the content of total sulfur in compressed natural gas as vehicle fuel shall be carried out according to GB/T 11060.4, GB/T 11060.5, GB/T 11060.7, or GB/T 11060.8. The arbitration test method is GB/T 11060.4.

4.4 The determination of the content of hydrogen sulfide in compressed natural gas as vehicle fuel shall be carried out according to GB/T 11060.1, GB/T 11060.2, or GB/T 11060.3. The arbitration test method is GB/T 11060.1.

4.5 The determination of the content of carbon dioxide in natural gas as vehicle fuel shall be carried out according to GB/T 13610, GB/T 27894.3, GB/T 27894.4, GB/T 27894.5, or GB/T 27894.6. The arbitration test method is GB/T 13610.

4.6 The determination of oxygen content in natural gas as vehicle fuel shall be carried out according to GB/T 13610, GB/T 27894.3, GB/T 27894.4, GB/T 27894.5, or GB/T 27894.6. The arbitration test method is GB/T 13610.

4.7 The determination of water content and water dew point of compressed natural gas as vehicle fuel shall be carried out according to GB/T 17283, GB/T 18619.1, GB/T 21069, or GB/T 27896. The arbitration test method is GB/T 17283. When the water dew point is known, according to GB/T 22634, it can be converted to the water content under standard reference conditions.

5 Storage and use

5.1 The storage vessels of compressed natural gas shall comply with the relevant provisions of TSGR 0004 or GB/T 19158. The steel cylinders for compressed natural gas as vehicle fuel shall comply with the relevant provisions of GB/T 17258.

5.2 Under operating pressure and temperature, there shall be no liquid hydrocarbon in compressed natural gas as vehicle fuel.

5.3 The diameter of solid particles in compressed natural gas as vehicle fuel shall be less than 5 μm .

5.4 Compressed natural gas as vehicle fuel shall have a noticeable odor. It shall odorize the natural gas which is odorless or of inadequate odor. The minimum amount of odorant shall conform to that, when natural gas leaks into the air and reaches 20% concentration of lower explosive limit, it shall be detected. Usually

Appendix A

(Informative)

Calculation method of methane number

A.1 Definition of methane number

MN Methane Number

An agreed value which represents the antiknock quality of fuel of spark ignition engine.

The methane number of a gas fuel is determined by using ASTM's evaluation method of octane number, by comparing the detonation tendency of this fuel with that of a standard fuel mixture in a standard engine test under specified conditions. When the antiknock performance of the tested gas fuel is the same as that of the standard fuel mixture of methane and hydrogen in a certain proportion, the number of volume percentage of methane in the standard fuel is the methane number of the gas fuel.

A.2 Octane number and methane number

A.2.1 Correlation between octane number and methane number

The U.S. Gas Technology Institute (GRI) [should be: GTI] used ASTM's evaluation method of octane number to measure the motor octane number (MON) of gas fuel. The measurement results show that, the MON of pure methane is about 140; the MON of most natural gas is 115~130. The MON of peak-shaving gas with high propane content (17%~25%) is 96~97. The GRI [should be: GTI], through its research, has derived two correlations between composition or hydrogen-carbon ratio and octane number, which are in good agreement with the experimental data, and can be applied to most conventional natural gas. In addition, there are two correlations between octane number and methane number derived from experimental data. These correlations are as follows.

A.2.2 Linear correlation between the composition of natural gas and octane number

The linear correlation between the composition of natural gas and octane number is shown in the equation (A.1):

This is an excerpt of the PDF (Some pages are marked off intentionally)

Full-copy PDF can be purchased from 1 of 2 websites:

1. <https://www.ChineseStandard.us>

- SEARCH the standard ID, such as GB 4943.1-2022.
- Select your country (currency), for example: USA (USD); Germany (Euro).
- Full-copy of PDF (text-editable, true-PDF) can be downloaded in 9 seconds.
- Tax invoice can be downloaded in 9 seconds.
- Receiving emails in 9 seconds (with download links).

2. <https://www.ChineseStandard.net>

- SEARCH the standard ID, such as GB 4943.1-2022.
- Add to cart. Only accept USD (other currencies - <https://www.ChineseStandard.us>).
- Full-copy of PDF (text-editable, true-PDF) can be downloaded in 9 seconds.
- Receiving emails in 9 seconds (with PDFs attached, invoice and download links).

Translated by: Field Test Asia Pte. Ltd. (Incorporated & taxed in Singapore. Tax ID: 201302277C)

About Us (Goodwill, Policies, Fair Trading...): <https://www.chinesestandard.net/AboutUs.aspx>

Contact: Wayne Zheng, Sales@ChineseStandard.net

Linkin: <https://www.linkedin.com/in/waynezhengwenrui/>

----- The End -----