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NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 17283.2-2026

Natural gas - Determination of moisture - Part 2: Determination of water content by the oscillation frequency difference method

天然气 水分的测定 第2部分：用振荡频差法测定水含量

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Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part

1.Structure and Drafting Rules of Standardization Documents". Drafting. This document is Part 2 of GB/T 17283, "Determination of Moisture Content in Natural Gas". GB/T 17283 has already published the following parts.

1.Determination of water dew point using a cooled mirror condensation hygrometer;

2.Determination of water content using the oscillation frequency difference method. Please note that some content in this document may involve patents. The issuing organization of this document assumes no responsibility for identifying patents. This document was proposed and is under the jurisdiction of the National Technical Committee on Standardization of Natural Gas (SAC/TC244). This document was drafted by: Gas Transmission Management Department, Southwest Oil and Gas Field Branch, China National Petroleum Corporation (CNPC). Southwest Oil and Gas Field Branch Natural Gas Research Institute of China Petroleum & Chemical Corporation, Yulin-Jinan Natural Gas Pipeline Branch of China Petroleum & Chemical Corporation, National Oil & Gas Pipeline Network Corporation West-East Gas Pipeline Branch, China National Petroleum Corporation Southwest Oil & Gas Field Branch, CNPC International Pipeline Company Limited, Tarim Oilfield Branch of China National Petroleum Corporation, and Chemical Research Institute of China Academy of Testing Technology Institute. The main drafters of this document are. Ding Sijia, Chen Xuezhong, Zhang Kai, Zhou Li, Lin Min, Chen Xuefeng, Chen Jingdong, Xu Chong, Luo Min, Zhang west, and He Min. Wang Huaqing, Tu

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Moisture is a harmful impurity in natural gas. High water dew points or high water content will affect the production, transportation, and use of natural gas, and bring safety risks. Water dew point, or water content, is an important quality indicator for natural gas. The purpose of determining the water dew point or water content of natural gas.

---Monitoring gas quality;

---Monitoring the dehydration operation at the gas processing plant;

---Determine the condensation conditions of water in the pipeline. Given the numerous methods available for determining the water dew point or water content of natural gas, my country currently has published several detection methods, including those for directly measuring the water dew point. There are methods for determining water content, and water dew point and water content are interchangeable, with standardized conversion methods. For ease of standardization... To ensure accurate management and user selection, existing standards for determining water dew point or water content will be integrated into a series of method standards. GB/T 17283 "Determination of Moisture Content in Natural Gas" is proposed to consist of the following 7 parts.

1.Determination of Water Dew Point Using Cooled Mirror Condensation Hygrometer Method. The purpose is to standardize the use of the cooled mirror condensation hygrometer method. A test method for determining the dew point of water using an instrument based on the principle of [the test method].

2.Determination of Water Content Using the Oscillation Frequency Difference Method. The purpose is to standardize the use of instruments employing the oscillation frequency difference method for determining water content. The experimental method.

3.Determination of Water Content by Laser Absorption Spectroscopy. The purpose is to standardize the use of instruments based on the laser absorption method for water content determination. Test methods for content.

4.Determination of Water Content Using Electronic Analysis. The purpose is to standardize the use of instruments employing electronic analysis principles for determining water content. The experimental method.

5.Determination of Water Content Using the Karl Fischer-Coulomb Method. The purpose is to standardize instruments used in the Karl Fischer-Coulomb method. Test methods for determining water content.

6.Determination of water content by absorption weighing. The purpose is to standardize the test method for determining water content using absorption weighing.

1 Scope

GB/T 17283.2-2026 is the Chinese national standard covering water in natural gas measured by the frequency shift of an oscillating sensor - water is what forms hydrates that block a pipeline and what makes CO2 corrosive, so it is measured continuously at custody transfer. Part 2 of the series, first edition of this part. It was issued on 28 January 2026 and has been in force since 1 August 2026, as a first edition. The document is under the responsibility of the Standardization Administration of China. This page is published from the official record of the 2026 edition; the clause text of a standard this recent is not yet in circulation, and the figures, limits and tables it contains are those of the document itself, delivered in full with the English translation.

This document describes the principle, equipment, measurement procedures, instrument calibration, and results data for determining the water content in natural gas using the oscillation frequency difference method. Processing, repeatability, and testing reports. This document applies to the online determination of water content (volume fraction) in pipeline natural gas, with a measurement range of 5x10^-6 to.2000x10^-6.

2 Normative references

The contents of the following documents, through normative references within the text, constitute essential provisions of this document. Dated citations are not included. For references to documents, only the version corresponding to that date applies to this document; for undated references, the latest version (including all amendments) applies. This document.

GB/T 13609 Natural Gas Sampling Guidelines

GB/T 20604 Natural Gas Vocabulary

3 Terms and Definitions

The terms and definitions defined in GB/T 20604 and the following terms and definitions apply to this document.

3.1 oscillation Under constant voltage, a thin sheet that can oscillate at a specific frequency will have its oscillation frequency change with the change in the mass of the sheet.

Note. Oscillators are generally divided into measuring oscillators and reference oscillators. Measuring oscillators are encapsulated in a measuring cell and can contact the sample gas phase. They are used for measuring oscillators. The mass of water adsorbed on the thin film; the reference oscillator is completely enclosed in a sealed reference cell, not connected to the outside world, and can be used with a constant voltage. It generates a constant oscillation frequency for calibrating measurement oscillators whose performance

may vary.

4.Principles Inside the testing chamber, a thin sheet contains a layer of sensitive moisture-absorbing material. Under certain temperature conditions and with a constant voltage applied, it will produce... An oscillation frequency is generated, and when a natural gas sample flows through a thin sheet, the hygroscopic material on the surface adsorbs moisture from the natural gas. The mass of the thin sheet surface... The change alters its inherent oscillation frequency, and this oscillation frequency changes proportionally to the change in the mass of water adsorbed by the coating. This is achieved by measuring the thin... The difference in plate oscillation frequency is used to determine the moisture content. After conversion, the corresponding moisture volume is obtained, and then combined with the sample gas injection volume, the moisture content can be calculated. Water content expressed as a volume fraction. The relationship between water mass and oscillation frequency is shown in equation (1). Deltam=-k/Deltaf (1) In the formula. Deltam

--- the mass of water adsorbed by the thin film, in milligrams (mg); k

--- mass sensitivity coefficient, in millihertz (mg·Hz); Deltaf

--- Change in oscillation frequency, in Hertz (Hz).