Natural gas — Determination of water by the Karl Fischer method

Part 2: Volumetric procedure
National foreword

This British Standard is the UK implementation of EN ISO 10101-2:2022. It is identical to ISO 10101-2:2022. It supersedes BS EN ISO 10101-2:1998, which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee PTI/15, Natural Gas and Gas Analysis.

A list of organizations represented on this committee can be obtained on request to its committee manager.

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English Version

Natural gas - Determination of water by the Karl Fischer method - Part 2: Volumetric procedure (ISO 10101-2:2022)

This European Standard was approved by CEN on 26 August 2022.

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European foreword

This document (EN ISO 10101-2:2022) has been prepared by Technical Committee ISO/TC 193 "Natural gas" in collaboration with Technical Committee CEN/TC 238 “Test gases, test pressures, appliance categories and gas appliance types” the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by March 2023, and conflicting national standards shall be withdrawn at the latest by March 2023.

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Endorsement notice

The text of ISO 10101-2:2022 has been approved by CEN as EN ISO 10101-2:2022 without any modification.
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ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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This document was prepared by Technical Committee ISO/TC 193, Natural Gas, Subcommittee SC 1, Analysis of natural gas, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 238, Test gases, test pressures, appliance categories and gas appliance types, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This second edition cancels and replaces the first edition (ISO 10101-2:1993), which has been technically revised.

The main changes are as follows:

— Clause 2 and Bibliography were revised;
— New fixed structure numbering inserted;
— Clause 5 was modified;
— Clause 9 was modified;
— 10.2 was modified.

A list of all parts in the ISO 10101 series can be found on the ISO website.
Introduction

Water vapour may be present in natural gas due to, for example, natural occurrence in the well production stream, the storage of gas in underground reservoirs, transmission or distribution through mains containing moisture or other reasons.
Natural gas — Determination of water by the Karl Fischer method —

Part 2: Volumetric procedure

WARNING — Local safety regulations should be taken into account, when the equipment is located in hazardous areas.

1 Scope

This document specifies a volumetric procedure for the determination of water content in natural gas. Volumes are expressed in cubic metres at a temperature of 273,15 K (0 °C) and a pressure of 101,325 kPa (1 atm). It applies to water concentrations between 5 mg/m$^3$ and 5 000 mg/m$^3$.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 383, Laboratory glassware — Interchangeable conical ground joints

ISO 10101-1, Natural gas- Determination of water by the Karl Fischer method – Part 1- Introduction

ISO 14532, Natural gas — Vocabulary

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 14532 apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

4 Principle

A measured volume of gas is passed through a cell containing a relatively small volume of absorbent solution. Water in the gas is extracted by the absorbent solution and subsequently titrated with Karl Fischer reagent. The design of the cell and the absorbent solution are chosen to ensure efficient collection of the water at the high flowrates necessary.

The principle and chemical reactions of the Karl Fischer method are given in ISO 10101-1:2020, Clauses 4 and 5; interferences are also described in ISO 10101-1:2020, Clause 5.

ISO 10101-1:2020, Clause 5 describes interfering substances which may be present in natural gas and corrections for the interference of hydrogen sulfide and mercaptans.