

Analysis of natural gas - Biomethane - Determination of VOCs by thermal desorption gas chromatography with flame ionization and/or mass spectrometry detectors (ISO 2620:2024)

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

<p>See Eesti standard EVS-EN ISO 2620:2024 sisaldab Euroopa standardi EN ISO 2620:2024 ingliskeelset teksti.</p> <p>Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.</p> <p>Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 03.04.2024.</p> <p>Standard on kättesaadav Eesti Standardimis-ja Akrediteerimiskeskusest.</p>	<p>This Estonian standard EVS-EN ISO 2620:2024 consists of the English text of the European standard EN ISO 2620:2024.</p> <p>This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation and Accreditation.</p> <p>Date of Availability of the European standard is 03.04.2024.</p> <p>The standard is available from the Estonian Centre for Standardisation and Accreditation.</p>
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English Version

Analysis of natural gas - Biomethane - Determination of
VOCs by thermal desorption gas chromatography with
flame ionization and/or mass spectrometry detectors (ISO
2620:2024)

Analyse du gaz naturel - Biométhane - Détermination
des COV par chromatographie en phase gazeuse à
désorption thermique avec détecteurs à ionisation de
flamme et/ou spectrométrie de masse (ISO 2620:2024)

Analyse von Erdgas - Biomethan - Bestimmung von
flüchtigen organischen Verbindungen durch
thermische Desorptionsgaschromatographie mit
Flammenionisations- und/oder
Massenspektrometriedektoren (TD GC FID/MS) (ISO
2620:2024)

This European Standard was approved by CEN on 1 April 2024.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

European foreword

This document (EN ISO 2620:2024) has been prepared by Technical Committee ISO/TC 193 "Natural gas" in collaboration with Technical Committee CEN/TC 408 "Natural gas and biomethane for use in transport and biomethane for injection in the natural gas grid" 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 October 2024, and conflicting national standards shall be withdrawn at the latest by October 2024.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

Any feedback and questions on this document should be directed to the users' national standards body/national committee. A complete listing of these bodies can be found on the CEN website.

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Endorsement notice

The text of ISO 2620:2024 has been approved by CEN as EN ISO 2620:2024 without any modification.

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Foreword

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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 408, *Natural gas and biomethane for use in transport and biomethane for injection in the natural gas grid*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

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Introduction

This document supports the implementation of specifications for biomethane and biogas when used in the natural gas grids and when used as a transport fuel. Implementation of these specifications require fit-for-purpose test methods with known performance and acceptable metrological traceability to support the trade in renewable gases and conformity assessment.

Depending on the production method, biogas usually contains volatile organic compounds (VOCs) such as terpenes, siloxanes, hydrocarbons, sulfur containing compounds, oxygenated hydrocarbons, halogenated hydrocarbons, ketones, alcohols, and esters. VOCs can also be found in the biomethane even after upgrading.

Analysis of natural gas — Biomethane — Determination of VOCs by thermal desorption gas chromatography with flame ionization and/or mass spectrometry detectors

1 Scope

This document describes a method for sampling and analysis of volatile organic compounds (VOCs), including siloxanes, terpenes, organic sulfur compounds, in natural gas and biomethane matrices, using thermal desorption gas chromatography with flame ionization and/or mass spectrometry detectors (TD-GC-FID/MS).

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 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 terminology 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 sample gas is drawn through one sorbent tube where VOCs are retained while highly volatile organic compounds as methane matrix gas pass through. Desorption of the tubes is then carried out by thermal desorption (TD) in which the adsorbed substances are released with heat and then transferred into a gas chromatograph (GC) equipped with a capillary column, a mass spectrometer (MS) and/or a flame ionization detector (FID). MS data of the separated VOC components are compared with a mass spectral library for compound identification. The use of the specific ions in addition to the retention time ensure positive identification of a given VOC. Retention indices can also be used to identify peaks by comparing measured retention indices with tabulated values. Quantification is performed using either the FID and/or the MS detector. The expected quantification limit is (2-5) ng which is equivalent to (20-50) $\mu\text{g}/\text{m}^3$ in the sampled gas assuming a 100 ml gas sample volume.

5 Reagents and materials

5.1 Individual VOCs

For calibration purposes, purity > 99 %. Standard mixtures commercially available.