



**SLOVENSKI STANDARD**  
**oSIST prEN ISO 2614:2023**

**01-februar-2023**

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**Analiza zemeljskega plina - Biometan - Določevanje terpenov z mikro plinsko kromatografijo (ISO/DIS 2614:2022)**

Analysis of natural gas - Biomethane - Determination of terpenes' content by micro gas chromatography (ISO/DIS 2614:2022)

Analyse von Erdgas - Analyse von Biomethan - Bestimmung des Terpenegehaltes durch Mikrogaschromatographie (ISO/DIS 2614:2022)

Analyse du gaz naturel - Biométhane - Détermination de la teneur en terpènes par micro-chromatographie en phase gazeuse (ISO/DIS 2614:2022)

**Ta slovenski standard je istoveten z: prEN ISO 2614**

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**ICS:**

75.060

Zemeljski plin

Natural gas

**oSIST prEN ISO 2614:2023**

**en,fr,de**



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## Analysis of natural gas — Biomethane — Determination of terpenes' content by micro gas chromatography

ICS: 75.060

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## ISO/DIS 2614:2022(E)

### Foreword

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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](http://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*.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at [www.iso.org/members.html](http://www.iso.org/members.html).

## Introduction

Terpenes can occur naturally in biogas and remain as trace components after treatment in the biomethane produced. Terpenes are odoriferous compounds that have the potential to mask the smell of the odorant added to the biomethane before injection into the natural gas grid. For safety reasons it is necessary to monitor these impurities.

This document describes a method to perform the analysis of five terpenes in biomethane. The method includes both on-line and offline measurement techniques based on chromatography and can be of interest to fuel specifications for biomethane.

This document contributes to the standardization of the determination of terpenes in biomethane. The document relates to good housekeeping in supply of biomethane into the natural gas grid.

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# Analysis of natural gas — Biomethane — Determination of terpenes' content by micro gas chromatography

## 1 Scope

This document specifies a micro gas chromatography method for the on-line or offline determination of the content of five terpenes in biomethane, namely:

- alpha-pinene
- beta-pinene
- para-cymene
- limonene
- 3-carene.

The method is specifically developed for these five compounds. Information about the compounds is given in [Annex A](#).

The method is applicable to the determination of individual amount fractions of the five terpenes from 1  $\mu\text{mol/mol}$  up to and including 10  $\mu\text{mol/mol}$ . With minor modifications it can also be used for terpene amount fractions above 10  $\mu\text{mol/mol}$ .

## 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/IEC Guide 98-3, *Uncertainty of measurement — Part 3: Guide to the expression of uncertainty in measurement (GUM:1995)*

ISO 6143, *Gas analysis — Comparison methods for determining and checking the composition of calibration gas mixtures*

ISO 10715, *Natural gas — Gas sampling*

ISO 14532, *Natural gas — Vocabulary*

ISO 16664, *Gas analysis — Handling of calibration gases and gas mixtures — Guidelines*

ISO 19229, *Gas analysis — Purity analysis and the treatment of purity data*

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 14532 and the following 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/>

**ISO/DIS 2614:2022(E)**

**3.1 terpenes**  
products mainly consisting of terpenic hydrocarbons obtained as by-products of an essential oil by distillation, concentration or other separation techniques

[SOURCE: ISO 9235:2021(en),<sup>[3]</sup> 3.31]

**4 Principles of analysis****4.1 General considerations**

The five terpenes to be determined in a biomethane sample are physically separated by means of gas chromatography (GC), and their amount fractions are measured by comparison with calibration data obtained under the same measurement conditions. Therefore, the calibration gas(es) and gas sample shall be analysed with the same measuring system under the same set of conditions.

**4.2 Sample handling and injection****4.2.1 Cleanness**

When a calibration or sample gas cylinder is to be connected to a gas system, always visually inspect the connection on the cylinder valve outlet. Carefully clean out any dirt, dust or particles with a dust-free cloth. Any trace of humidity should be purged out with dry inert gas.

Make sure that all transfer lines are free of dirt, rust, grease or other particles. Change all tubing/fittings if there is any suspicion of impurities or damage. Particle filters can be helpful, but they shall only contain material proposed in ISO 10715 and shall not cause adsorption of terpenes.

**4.2.2 Sampling of biomethane into vessels**

Sampling shall be performed in accordance with ISO 10715.

Use appropriate materials or passivation that reduce terpenes adsorption to a level that will not cause analytical bias (e.g., passivated stainless steel). The length of sampling lines should be minimised where possible to minimise adsorption.

A previously evacuated vessel, for example a gas cylinder or sample canister is used to gather the sample. It is important that the wetted surfaces are made of appropriate materials (or have appropriate passivation) to prevent adsorption. This sampling method is applicable where the biomethane pressure is either above or below atmospheric pressure, and the source temperature is either higher or lower than the sample vessel temperature.

NOTE An example of the evacuated cylinder technique is described in ISO 10715.

**4.2.3 Sample injection**

Special attention shall be given to prevent condensation of heavier components when handling the sample contained in the sample cylinder. ISO 16664 shall be followed for the handling of calibration gases and gas mixtures.

When on-line biomethane analysis is performed on site the following can help to minimize the danger of condensation:

- external heating of the sample gas at or before the reducer, and
- using more than one reducer to drop the pressure in stages.