



SLOVENSKI STANDARD SIST EN ISO 10715:2023

01-januar-2023

Nadomešča:
SIST EN ISO 10715:2000

Zemeljski plin - Vzorčenje (ISO 10715:2022)

Natural gas - Gas sampling (ISO 10715:2022)

Erdgas - Probenahme (ISO 10715:2022)

Gaz naturel - Échantillonnage de gaz (ISO 10715:2022)

Ta slovenski standard je istoveten z: **EN ISO 10715:2022**

ICS:

75.060

Zemeljski plin

Natural gas

SIST EN ISO 10715:2023

en,fr,de

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN ISO 10715

October 2022

ICS 75.060

Supersedes EN ISO 10715:2000

English Version

Natural gas - Gas sampling (ISO 10715:2022)

Gaz naturel - Échantillonnage de gaz (ISO 10715:2022)

Erdgas - Probenahme (ISO 10715:2022)

This European Standard was approved by CEN on 7 July 2022.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and United Kingdom.

SIST EN ISO 10715:2023

<https://standards.iteh.ai/catalog/standards/sist/d6fa5485-6460-4621-9889-b204cc139ae2/sist-en-iso-10715-2023>



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

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

Contents	Page
European foreword.....	3

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN ISO 10715:2023

<https://standards.iteh.ai/catalog/standards/sist/d6fa5485-6460-4621-9889-b204cc139ae2/sist-en-iso-10715-2023>

European foreword

This document (EN ISO 10715:2022) 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 April 2023, and conflicting national standards shall be withdrawn at the latest by April 2023.

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.

This document supersedes EN ISO 10715:2000.

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.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom.

Endorsement notice

The text of ISO 10715:2022 has been approved by CEN as EN ISO 10715:2022 without any modification.

INTERNATIONAL STANDARD

**ISO
10715**

Second edition
2022-10

Natural gas — Gas sampling

Gaz naturel — Échantillonnage de gaz

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN ISO 10715:2023

<https://standards.iteh.ai/catalog/standards/sist/d6fa5485-6460-4621-9889-b204cc139ae2/sist-en-iso-10715-2023>



Reference number
ISO 10715:2022(E)

© ISO 2022

iTeh STANDARD PREVIEW (standards.iteh.ai)

SIST EN ISO 10715:2023

<https://standards.iteh.ai/catalog/standards/sist/d6fa5485-6460-4621-9889-b204cc139ae2/sist-en-iso-10715-2023>



COPYRIGHT PROTECTED DOCUMENT

© ISO 2022

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

Page

Foreword	vi
Introduction	vii
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Safety considerations	4
5 Principles of sampling	4
6 The concept of representative sample	4
7 Types of sampling	5
7.1 Sampling method considerations	5
7.2 Spot sampling	6
7.2.1 General	6
7.2.2 Fill-and-empty method	6
7.2.3 Controlled-rate method	7
7.2.4 Evacuated-cylinder method	7
7.2.5 Helium pre-fill method	7
7.2.6 Floating-piston cylinder method	7
7.2.7 Single cavity sample cylinder	7
7.2.8 Sampling frequency	7
7.3 Incremental sampling (continuous or composite)	9
7.3.1 General considerations	9
7.3.2 Intervals	9
7.3.3 System considerations	9
7.3.4 Monitoring the filling process	10
7.3.5 Cylinder tracking	10
7.3.6 Overpressure protection	10
7.4 Online or direct sampling	10
7.4.1 General considerations	10
7.4.2 Automatic drainage	12
7.4.3 Reducing the pressure	12
7.4.4 Inert-gas purging	13
7.4.5 Safety/pressure relief valve	13
7.4.6 Heating of sample line	13
8 Sampling location	13
8.1 General	13
8.2 Sampling place	13
8.2.1 General	13
8.2.2 Relevant gas	14
8.2.3 Undisturbed gas	14
8.2.4 Access	14
8.3 Sampling position	15
8.4 Sampling point	15
9 Ideal implementation of gas sampling	16
9.1 General	16
9.2 Gas sorption	16
9.2.1 General	16
9.2.2 Surface treatment	17
9.2.3 Sorption considerations regarding sampling equipment	17
9.2.4 Equilibrating of sampling equipment	17
9.3 Materials used in sampling	18
9.3.1 General considerations	18

ISO 10715:2022(E)

9.3.2	Steel grades	19
9.3.3	Epoxy coatings	19
9.3.4	Other polymers	19
9.3.5	Rubbers	19
9.3.6	Bimetallic corrosion	19
9.4	Sample contamination	19
9.4.1	Cleanliness	19
9.4.2	Cleaning sampling systems	19
9.4.3	Pre-charging of sample cylinders	20
9.5	Sample condensation	20
9.5.1	Temperature	20
9.5.2	Pressure reduction and Joule Thomson cooling	20
9.5.3	Condensation and revaporization	22
9.6	Disturbance of the flow through the sampling system	24
9.7	Delay time	24
9.7.1	Direct sampling method	24
9.7.2	Indirect sampling method	25
10	Sampling equipment	26
10.1	General	26
10.2	Probes	27
10.2.1	General	27
10.2.2	Straight-tube probe	27
10.2.3	Probe regulator	28
10.2.4	Pitot probe	29
10.3	Tubings	30
10.3.1	Sampling and sample lines	30
10.3.2	Bypass constructions	31
10.4	Filters, membranes and separators	31
10.5	Valves and safety valves	32
10.6	Fittings	33
10.7	Flow monitoring and control	33
10.8	Pressure reducers	33
10.9	Pressure sensor/manometers	33
10.10	Heating devices	33
10.11	Seals and lubricants	34
10.12	Sample containers or cylinders	34
10.12.1	General	34
10.12.2	Standard or single cavity cylinder	35
10.12.3	Floating-piston cylinders or Constant Pressure cylinders	35
10.13	Concentration devices	36
10.14	Number and sequence of equipment	37
11	Verification of the system	38
12	Troubleshooting	39
Annex A (informative)	Purposes of sampling, panel of compounds and information in the sampling report	41
Annex B (informative)	Procedures for sampling	42
Annex C (informative)	Gas sorption effect: adsorption/desorption	49
Annex D (informative)	Cleaning of steel sampling cylinders	50
Annex E (informative)	Joule-Thomson cooling and phase behaviour	51
Annex F (informative)	Vortex shedding and associated problems	54
Annex G (informative)	Guidelines for the calculation of the residence time	58
Annex H (informative)	Protocol for gas sampling system verification	66

Annex I (informative) Number of samples	68
Bibliography	70

iTeh STANDARD PREVIEW (standards.iteh.ai)

SIST EN ISO 10715:2023

<https://standards.iteh.ai/catalog/standards/sist/d6fa5485-6460-4621-9889-b204cc139ae2/sist-en-iso-10715-2023>

ISO 10715:2022(E)

Foreword

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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

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

This second edition cancels and replaces the first edition (ISO 10715:1997), which has been technically revised.

The main changes are as follows:

- This new edition has placed a significant relevance on regular service, maintenance and validation of installed sample systems which previously have not been given proper attention. Sample systems, or at least the fixed/installed portion of them, have all too often been installed and forgotten without realization that through use they become more and more contaminated leading to distortions of the composition of the gas being sampled.
- Introduction of new sampling devices.

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.

Introduction

The composition, quality, and properties of natural gas vary according to amongst others its source, level of processing, natural mixing at interconnection points, storage facilities, blending stations, fluctuating demand for some of its derivatives such as LPG (Liquefied Petroleum Gases), and increasingly the need to transport unconventional and renewable gases in the same network etc.

The variations that occur are closely monitored and controlled to ensure safety of the general public as well as operational staff, plant, equipment and the gas infrastructures in general. Additionally and commercially critical the energy content of the gas differs with these variations and is very accurately monitored for billing and fiscal purposes because of the very large sums of money involved.

The variations that occur can be best collectively grouped under the generic term “Gas Quality” which is subsequently referred to as GQ in this document.

For monitoring and controlling GQ, samples are taken at many and various stages along the way and analysed. Such samples are taken under many different process parameters with a need to always ensure that any gas that is subsequently analysed for such monitoring purposes is truly representative of the bulk.

Methods of measuring GQ are well specified in numerous ISO standards as are the means of calibrating such measuring instruments, however all those measurements and calibrations are all but futile if the samples used for making such measurements are not representative.

This document provides means to ensure sampling systems and sampling processes are designed, located, installed, operated, and maintained such that samples obtained are representative of the bulk to which they are attributed. It also specifies comprehensive information on the way that samples can be contaminated, altered, modified or degraded and methods, means and procedures for ensuring that the sample remains representative from the start of the sampling process to the point where the sample is presented to the analytical device.

[SIST EN ISO 10715:2023](https://standards.iteh.ai/catalog/standards/sist/d6fa5485-6460-4621-9889-b204cc139ae2/sist-en-iso-10715-2023)

<https://standards.iteh.ai/catalog/standards/sist/d6fa5485-6460-4621-9889-b204cc139ae2/sist-en-iso-10715-2023>

Natural gas — Gas sampling

WARNING — General quality aspects of natural gas are detailed in ISO 13686^[1]. However, it is possible that the standard does not cover all the trace constituents that are increasingly necessary to monitor for various reasons.

1 Scope

This document gives means for ensuring that samples of natural gas and natural gas substitutes that are conveyed into transmission and distribution grids are representative of the mass to which they are allocated.

NOTE To ensure that a particular gas is taken into account in the standard, please see [Annex A](#).

This document is applicable for sampling at sites and locations where interchangeability criteria, energy content and network entry conditions are measured and monitored and is particularly relevant at cross border and fiscal measurement stations. It serves as an important source for control applications in natural gas processing and the measurement of trace components.

This document is applicable to natural dry gas (single phase - typically gas transiting through natural gas pipelines) sampling only. On occasion a natural gas flow can have entrained liquid hydrocarbons. Attempting to sample a wet natural gas flow introduces the possibility of extra unspecified uncertainties in the resulting flow composition analysis. Sampling a wet gas (two or three phases) flow is outside the scope of this document.

This document does not apply to the safety issues associated with gas sampling.

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 from 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/>

3.1

absorption

extraction of one or more components from a mixture of gases when brought into contact with a liquid

Note 1 to entry: The assimilation or extraction process causes (or is accompanied by) a physical or chemical change, or both, in the sorbent material.

Note 2 to entry: The gaseous components are retained by capillary, osmotic, chemical, or solvent action.

EXAMPLE Removal of water from natural gas using glycol.