SLOVENSKI STANDARD
SIST EN ISO 14111:2000

01-december-2000

Zemeljski plin - Smernice za sledljivost pri analizah (ISO 14111:1997)

Natural gas - Guidelines to traceability in analysis (ISO 14111:1997)

Erdgas - Leitlinien für die Rückführbarkeit in der Analytik (ISO 14111:1997)

Gaz naturel - Lignes directrices pour la traçabilité en analyse (ISO 14111:1997)

Ta slovenski standard je istoveten z: **EN ISO 14111:1999**

ICS:

75.060 Zemeljski plin Natural gas

SIST EN ISO 14111:2000 **en**

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN ISO 14111

March 1999

ICS 75.060

English version

Natural gas - Guidelines to traceability in analysis (ISO 14111:1997)

Gaz naturel - Lignes directrices pour la traçabilité en analyse (ISO 14111:1997)

Erdgas - Leitlinien für die Rückführbarkeit in der Analytik (ISO 14111:1997)

This European Standard was approved by CEN on 3 March 1999.

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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

Foreword

The text of the International Standard from Technical Committee ISO/TC 193 "Natural gas" of the International Organization for Standardization (ISO) has been taken over as an European Standard by CEN/CS.

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of an identical text or by endorsement, at the latest by September 1999, and conflicting national standards shall be withdrawn at the latest by September 1999.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

Endorsement notice

The text of the International Standard ISO 14111:1997 has been approved by CEN as a European Standard without any modification.

NOTE: Normative references to International Standards are listed in annex ZA (normative).

Annex ZA (normative)
Normative references to international publications with their relevant European publications

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

Publication	Year	Title	EN	Year
ISO 9001	1994	Quality systems - Model for quality assurance in design/ development, production, installation and servicing	EN ISO 9001	1994
ISO 10012-1	1992	Quality assurance requirements for measuring equipment - Part 1: Metrological confirmation system for measuring equipment	EN 30012-1	1993

INTERNATIONAL STANDARD

ISO 14111

First edition
1997-03-15

Natural gas — Guidelines to traceability in analysis

Gaz naturel — Lignes directrices pour la traçabilité en analyse

Reference number
ISO 14111:1997(E)

Contents

International Organization for Standardization
Case postale 56 • CH-1211 Genève 20 • Switzerland
Internet: central@iso.ch
X.400: c=ch; a=400net; p=iso; o=isocs; s=central

Printed in Switzerland

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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 14111 was prepared by Technical Committee ISO/TC 193, *Natural gas*, Subcommittee SC 1, *Analysis of natural gas*.

Annexes A to C of this International Standard are for information only.

Introduction

At a time when assurances of measurement accuracy in natural-gas analyses are increasingly being sought, every analytical chemist responsible for the design and operation of systems used in such analyses needs to be aware of, and adopt, suitable means by which he or she will be able to provide these assurances. This implies that the analyst must employ validated methods in which each result is securely linked, through a series of reference materials (reference gas mixtures), to accepted metrological standards. The formal structure which the analyst creates in doing this constitutes what is called a traceability chain. Only by this means will the analyst be able to secure and support a proper estimate of measurement accuracy (uncertainty).

This seemingly simple concept is elaborated in considerable detail in this International Standard. The practical considerations involved in the establishment of a satisfactory traceability chain give rise to challenging problems, particularly in natural-gas analysis, but relevant and useful advice is provided.

At present, traceability of measurement is universally defined through the existence of unbroken calibration chains ending at the level of international or national measurement standards realizing appropriate SI units. This concept originates from the field of physical metrology, where it has been implemented with apparent success. Transfer of the metrological scheme to chemical analysis and other domains in the field of testing is, however, a highly difficult task, for which standard methods are not yet available. Therefore it is not possible, at present, to standardize the implementation of measurement traceability in natural-gas analysis, or in other areas of chemical analysis.

For the reasons indicated above, this International Standard does not give any specific traceability protocols. Instead, its purpose is to

— clarify fundamental concepts involved in chemical traceability;

— identify basic problems in the application of metrology in chemistry;

— indicate feasible solutions on a reference material basis;

— assist in the design of practical implementations using reference gas mixtures;

— serve as a reference document for the application of the traceability concept in other International Standards for natural-gas analysis.

Natural gas — Guidelines to traceability in analysis

1 Scope

This International Standard provides general guidelines on the implementation and application of traceability concepts in the analysis of natural gas. Its purpose is to lay down the foundations for the development of specific traceability protocols in other International Standards for natural-gas analysis.

NOTE — Besides the field of natural-gas analysis, this International Standard could also be useful as a guidance document in other areas of gas analysis and in related fields such as air quality measurement, vehicle emission monitoring and reference-gas mixture preparation.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 3534-1:1993, *Statistics — Vocabulary and symbols — Part 1: Probability and general statistical terms.*

ISO 5168:—[1], *Measurement of fluid flow — Evaluation of uncertainties.*

ISO 5725-1:1994, *Accuracy (trueness and precision) of measurement methods and results — Part 1: General principles and definitions.*

ISO 5725-2:1994, *Accuracy (trueness and precision) of measurement methods and results — Part 2: Basic method for the determination of repeatability and reproducibility of a standard measurement method.*

ISO 5725-3:1994, *Accuracy (trueness and precision) of measurement methods and results — Part 3: Intermediate measures of the precision of a measurement method.*

ISO 5725-4:1994, *Accuracy (trueness and precision) of measurement methods and results — Part 4: Basic methods for the determination of the trueness of a standard measurement method.*

ISO 5725-6:1994, *Accuracy (trueness and precision) of measurement methods and results — Part 6: Use in practice of accuracy values.*

ISO 6142:1981, *Gas analysis — Preparation of calibration gas mixtures — Weighing methods* (including addendum 1).

1) To be published. (Revision of ISO 5168:1978)

ISO 6143:1981, *Gas analysis — Determination of composition of calibration gas mixtures — Comparison methods.*

ISO 6711:1981, *Gas analysis — Checking of calibration gas mixtures by a comparison method.*

ISO 6974-1:— [2], *Natural gas — Determination of composition with defined uncertainty by gas chromatography — Part 1: Guidelines for tailored analysis.*

ISO 6974-2:— [2], *Natural gas — Determination of composition with defined uncertainty by gas chromatography — Part 2: Measuring-system characteristics and statistics for data processing.*

ISO 6976:1995, *Natural gas — Calculation of calorific values, density, relative density and Wobbe index from composition.*

ISO 9001:1994, *Quality systems — Model for quality assurance in design, development, production, installation and servicing.*

ISO 10012-1:1992, *Quality assurance requirements for measuring equipment — Part 1: Metrological confirmation system for measuring equipment.*

ISO 10723:1995, *Natural gas — Performance requirements for on-line analytical systems.*

ISO Guide 30:1992, *Terms and definitions used in connection with reference materials.*

ISO Guide 33:1989, *Uses of certified reference materials.*

ISO Guide 35:1989, *Certification of reference materials — General and statistical principles.*

BIPM/IEC/ISO/OIML/IFCC/IUPAC: International vocabulary of basic and general terms in metrology (VIM), second edition, 1993.

3 Definitions

For the purposes of this International Standard, the following definitions apply.

3.1 traceability: A property of the result of a measurement or the value of a standard whereby it can be related to stated references, usually national or international standards, through an unbroken chain of comparisons all having stated uncertainties.

NOTES

1 The concept is often expressed by the adjective "traceable".

2 The unbroken chain of comparisons is called a "traceability chain". [VIM]

3.2 (measurement) standard, etalon: A material measure, measuring instrument, reference material or measuring system intended to define, realize, conserve or reproduce a unit or one or more values of a quantity to serve as a reference.

EXAMPLES

a) 1 kg mass standard;

b) 100 Ω standard resistor;

c) standard ammeter;

d) caesium frequency standard;

e) standard hydrogen electrode;

f) reference solution of cortisol in human serum having a certified concentration. [VIM]

2) To be published. (Revision, in parts, of ISO 6974:1984)