

norm

NEN-EN-ISO 6974-1

Natural gas - Determination of composition and associated uncertainty by gas chromatography - Part 1: General guidelines and calculation of composition (ISO/DIS 6974-1:2010, IDT)

Publicatie uitsluitend voor commentaar

mei 2010
ICS 75.060

Commentaar vóór 2010-07-25

Zal vervangen NEN-EN-ISO 6974-1:2001

Als Europees normontwerp is gepubliceerd: prEN ISO 6974-1:2010, IDT

Definitief vastgestelde normen zullen als Nederlandse norm gelden. Daarom wordt dit normontwerp in Nederland voor commentaar gepubliceerd. Op het ontwerp ingebracht commentaar zal aan de bevoegde normcommissie worden voorgelegd die hiermee rekening zal houden bij de bepaling van de Nederlandse stem. Indien er geen bezwaar bij NEN wordt gebracht, kan dat leiden tot ongewijzigde definitieve vaststelling van het ontwerp als norm.

Van Europese normen bestaan drie officiële versies: Engels, Frans en Duits. Voor Nederland zal de Engelse versie gelden. Daarnaast kan er gekozen worden voor een andere geautoriseerde versie in het Nederlands.

Normcommissie 310193 "Aardgas"

Apart from exceptions provided by the law, nothing from this publication may be duplicated and/or published by means of photocopy, microfilm, storage in computer files or otherwise, which also applies to full or partial processing, without the written consent of the Netherlands Standardization Institute.

The Netherlands Standardization Institute shall, with the exclusion of any other beneficiary, collect payments owed by third parties for duplication and/or act in and out of law, where this authority is not transferred or falls by right to the Reproduction Rights Foundation.

Auteursrecht voorbehouden. Behoudens uitzondering door de wet gesteld mag zonder schriftelijke toestemming van het Nederlands Normalisatie-instituut niets uit deze uitgave worden verveelvoudigd en/of openbaar gemaakt door middel van fotokopie, microfilm, opslag in computerbestanden of anderszins, hetgeen ook van toepassing is op gehele of gedeeltelijke bewerking.

Het Nederlands Normalisatie-instituut is met uitsluiting van ieder ander gerechtigd de door derden verschuldigde vergoedingen voor verveelvoudiging te innen en/of daartoe in en buiten rechte op te treden, voor zover deze bevoegdheid niet is overgedragen c.q. rechtens toekomt aan de Stichting Reprorecht.

Although the utmost care has been taken with this publication, errors and omissions cannot be entirely excluded. The Netherlands Standardization Institute and/or the members of the committees therefore accept no liability, not even for direct or indirect damage, occurring due to or in relation with the application of publications issued by the Netherlands Standardization Institute.

Hoewel bij deze uitgave de uiterste zorg is nagestreefd, kunnen fouten en onvolledigheden niet geheel worden uitgesloten. Het Nederlands Normalisatie-instituut en/of de leden van de commissies aanvaarden derhalve geen enkele aansprakelijkheid, ook niet voor directe of indirecte schade, ontstaan door of verband houdend met toepassing van door het Nederlands Normalisatie-instituut gepubliceerde uitgaven.

Voorbeeld
Preview

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

DRAFT
prEN ISO 6974-1

March 2010

ICS 75.060

Will supersede EN ISO 6974-1:2001

English Version

Natural gas - Determination of composition and associated uncertainty by gas chromatography - Part 1: General guidelines and calculation of composition (ISO/DIS 6974-1:2010)

Gaz naturel - Détermination de la composition avec une incertitude définie par chromatographie en phase gazeuse - Partie 1: Lignes directrices générales et calculs de la composition (ISO/DIS 6974-1:2010)

Erdgas - Bestimmung der Zusammensetzung und der zugehörigen Unsicherheit durch Gaschromatographie - Teil 1: Allgemeine Leitlinien und Berechnung der Zusammensetzung (ISO/DIS 6974-1:2010)

This draft European Standard is submitted to CEN members for parallel enquiry. It has been drawn up by the Technical Committee CEN/SS N21.

If this draft becomes a European Standard, 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.

This draft European Standard was established by CEN 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 Management Centre has the same status as the official version.

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, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

Warning : This document is not a European Standard. It is distributed for review and comments. It is subject to change without notice and shall not be referred to as a European Standard.



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

Management Centre: Avenue Marnix 17, B-1000 Brussels

Contents

Page

Foreword.....3

Voorbeeld
Preview

Foreword

This document (prEN ISO 6974-1:2010) has been prepared by Technical Committee ISO/TC 193 "Natural gas".

This document is currently submitted to the parallel Enquiry.

This document will supersede EN ISO 6974-1:2001.

Endorsement notice

The text of ISO/DIS 6974-1:2010 has been approved by CEN as a prEN ISO 6974-1:2010 without any modification.

Copyright
Preview

Voorbeeld
Preview



Natural gas — Determination of composition and associated uncertainty by gas chromatography —

Part 1: General guidelines and calculation of composition

Gaz naturel — Détermination de la composition avec une incertitude définie par chromatographie en phase gazeuse —

Partie 1: Lignes directrices générales et calculs de la composition

[Revision of first edition (ISO 6974-1:2000)]

ICS 75.060

ISO/CEN PARALLEL PROCESSING
<p>This draft has been developed within the International Organization for Standardization (ISO), and processed under the ISO-lead mode of collaboration as defined in the Vienna Agreement.</p> <p>This draft is hereby submitted to the ISO member bodies and to the CEN member bodies for a parallel five-month enquiry.</p> <p>Should this draft be accepted, a final draft, established on the basis of comments received, will be submitted to a parallel two-month approval vote in ISO and formal vote in CEN.</p>
<p>To expedite distribution, this document is circulated as received from the committee secretariat. ISO Central Secretariat work of editing and text composition will be undertaken at publication stage.</p> <p>Pour accélérer la distribution, le présent document est distribué tel qu'il est parvenu du secrétariat du comité. Le travail de rédaction et de composition de texte sera effectué au Secrétariat central de l'ISO au stade de publication.</p>

THIS DOCUMENT IS A DRAFT CIRCULATED FOR COMMENT AND APPROVAL. IT IS THEREFORE SUBJECT TO CHANGE AND MAY NOT BE REFERRED TO AS AN INTERNATIONAL STANDARD UNTIL PUBLISHED AS SUCH.

IN ADDITION TO THEIR EVALUATION AS BEING ACCEPTABLE FOR INDUSTRIAL, TECHNOLOGICAL, COMMERCIAL AND USER PURPOSES, DRAFT INTERNATIONAL STANDARDS MAY ON OCCASION HAVE TO BE CONSIDERED IN THE LIGHT OF THEIR POTENTIAL TO BECOME STANDARDS TO WHICH REFERENCE MAY BE MADE IN NATIONAL REGULATIONS.

RECIPIENTS OF THIS DRAFT ARE INVITED TO SUBMIT, WITH THEIR COMMENTS, NOTIFICATION OF ANY RELEVANT PATENT RIGHTS OF WHICH THEY ARE AWARE AND TO PROVIDE SUPPORTING DOCUMENTATION.

PDF disclaimer

This PDF file may contain embedded typefaces. In accordance with Adobe's licensing policy, this file may be printed or viewed but shall not be edited unless the typefaces which are embedded are licensed to and installed on the computer performing the editing. In downloading this file, parties accept therein the responsibility of not infringing Adobe's licensing policy. The ISO Central Secretariat accepts no liability in this area.

Adobe is a trademark of Adobe Systems Incorporated.

Details of the software products used to create this PDF file can be found in the General Info relative to the file; the PDF-creation parameters were optimized for printing. Every care has been taken to ensure that the file is suitable for use by ISO member bodies. In the unlikely event that a problem relating to it is found, please inform the Central Secretariat at the address given below.

Copyright
Preview

Copyright notice

This ISO document is a Draft International Standard and is copyright-protected by ISO. Except as permitted under the applicable laws of the user's country, neither this ISO draft nor any extract from it may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, photocopying, recording or otherwise, without prior written permission being secured.

Requests for permission to reproduce should be addressed to either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Reproduction may be subject to royalty payments or a licensing agreement.

Violators may be prosecuted.

Contents

	Page
1	Scope 1
2	Normative references 2
3	Terms and definitions 2
4	Symbols (and abbreviated terms) 5
4.1	Symbols 5
4.2	Subscripts 8
4.3	Superscripts 9
5	Principles of analysis 9
5.1	Introduction 9
5.2	Single and multiple operation methods 9
5.2.1	Single operation methods 9
5.2.2	Multiple operation with bridging methods 9
5.2.3	Multiple operation without bridging methods 10
5.3	Mode of operation 10
5.4	Directly and indirectly measured components 11
5.5	Normalisation 11
6	Analytical procedure 11
6.1	General 11
6.2	Step 1 – Defining the working range 14
6.3	Step 2 – Defining the requirements of the analytical method 14
6.4	Step 3 – Equipment and working conditions 15
6.5	Step 4 – Response characteristics (primary calibration or performance evaluation) 15
6.5.1	General 15
6.5.2	Frequency 15
6.5.3	Selection of reference gases 16
6.5.4	Measurement of reference gases 16
6.5.5	Regression analysis 17
6.5.6	Selection of the regression functions 18
6.6	Step 5 – Relative response factors 20
6.7	Step 6 – Routine calibration / quality assurance check 20
6.7.1	Frequency 21
6.7.2	Procedure 21
6.8	Step 7 – Analysis of samples 21
6.9	Step 8 - Calculation of component mole fractions 22
6.9.1	Calculation of component mole fractions using the ‘mean normalisation’ method 22
6.9.2	Calculation of component mole fractions using the ‘run-by-run normalisation’ method 23
6.9.3	Non-linearity errors (Type 2 analyses) 25
7	Control chart 26
8	Test report 26
Annex A (informative) Comparative application ranges and characteristics of analytical methods described in Parts 3 to 6 of ISO 6974 27	
Annex B (normative) Alternative approach for bridging and normalisation 30	
B.1	Introduction 30
B.2	Bridging – normalisation 32
B.2.1	Construction of Σ 32
B.2.2	Construction of B 33
B.2.3	Construction of A 34
B.2.4	Construction of D 34

B.2.5	Construction of Y	35
B.2.6	Construction of H	35
B.2.7	Construction of Z	35
B.3	Uncertainty calculation	36
Annex C	(informative) Methane-by-difference approach	38
C.1	Introduction	38
C.2	Calculation of processed component mole fractions	38
Annex D	(normative) Relative response factors	40
D.1	Relative response factors for flame ionisation detectors (FIDs)	40
D.2	Relative response factors for thermal conductivity detectors (TCDs)	40
Annex E	(informative) Testing for outliers	43
E.1	General Remarks	43
E.2	Additional information	43
Annex F	(normative) Pressure correction	45
F.1	Pressure correction during calibration and sample analysis	45
F.1.1	General Remarks	45
F.1.2	Normalisation	45
F.1.3	Calibration	45
F.1.4	Sample analysis	46
F.1.5	Uncertainty in pressure correction procedure	46
Annex G	(informative) Software suitable for generalised least squares regression analysis	48
G.1	General remarks	48
G.2	XLGENLINE	48
G.3	B_LEAST	48
G.4	GasTools	49
G.5	Disclaimer	49
Annex H	(informative) Use of control charts	51

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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. 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.

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.

ISO 6974-1 was prepared by Technical Committee ISO/TC 193, *Natural gas*, Subcommittee SC 1.

This second edition jointly with the second edition of ISO 6974 Part 2 cancel and replace both ISO 6974-1:2000 and ISO 6974-2:2000.

ISO 6974 consists of the following Parts, under the general title *Natural gas — Determination of composition with defined uncertainty by gas chromatography*:

- *Part 1: General guidelines and calculation of composition*
- *Part 2: Uncertainty calculations*
- *Part 3: Determination of hydrogen, helium, oxygen, nitrogen, carbon dioxide and hydrocarbons up to C₈ using two packed columns*
- *Part 4: Determination of nitrogen, carbon dioxide and C₁ to C₅ and C₆₊ hydrocarbons for a laboratory and on-line measuring system using two columns*
- *Part 5: Determination of nitrogen, carbon dioxide and C₁ to C₅ and C₆₊ hydrocarbons for a laboratory and on-line process application using three columns*
- *Part 6: Determination of hydrogen, helium, oxygen, nitrogen, carbon dioxide and hydrocarbons up to C₈ using three capillary columns*

Annexes A, C, E, G and H of this Part of this Standard are for information only. Annexes B, D and F are normative Annexes.

Introduction

ISO 6974 (all Parts) describes methods of analysis of natural gas, and methods to calculate the component mole fractions and uncertainties. ISO 6974 (all Parts) is designed for the measurement of H₂, He, O₂, N₂, CO₂ and hydrocarbons as either individual components or as a group, for example a total figure for hydrocarbons above C₅ defined as C₆₊. This approach is suitable for a range of end applications, for example calibration of gas mixtures or to provide natural gas composition and uncertainty data to be used in the calculation of calorific value and other additive physical properties of the gas. Details of these end applications are provided in Part 3 and subsequent Parts of ISO 6974.

This Part of ISO 6974 gives general guidelines for the gas chromatographic analysis of natural gas and methods of data processing to determine compositions of component mole fractions. This second edition jointly with the second edition of ISO 6974 Part 2 cancel and replace both ISO 6974-1:2000 and ISO 6974-2:2000

Part 2 of ISO 6974 describes the steps required to calculate the uncertainty in each component mole fraction.

Part 3 and subsequent Parts of ISO 6974 describe different gas chromatographic methods. These methods cover both daily practice in the laboratory and on-line field applications. Informative Annex A of this Part gives a comparison of the characteristics of the analytical methods described in Part 3 and subsequent Parts of ISO 6974.

Compliance with this Standard requires:

- If only component mole fractions are required: This Part with a method of analysis that meets the requirements of, and is operated in accordance with this Part. This could be either one of Part 3 or subsequent Parts of this Standard or another chromatographic method of choice. Any chromatographic method not forming Part of this Standard shall be documented in the same manner and to the same detail as used to specify the methods in Part 3 and subsequent Parts of this Standard.
- If component mole fractions and associated uncertainties are required: This Part with Part 2 and a method of analysis that meets the requirements of, and is operated in accordance with this Part (as described in the above bullet point).

This Part of ISO 6974 describes all the essential steps for setting up an analysis including outlining the structure of the analysis, defining the working ranges and establishing the analytical procedure. When the working ranges of the components have been defined, an evaluation is carried out to determine whether components are to be considered as:

- Main components or groups of components to be analysed using direct measurement (directly measured components);
- Components or groups of components to be analysed using indirect measurement, by reference to a different reference component in the calibration gas mixture (indirectly measured components);
- Components that are not measured and whose mole fraction can be assumed to be constant (components not measured).

Bestelformulier

Stuur naar:

NEN Standards Products & Services
t.a.v. afdeling Klantenservice
Antwoordnummer 10214
2600 WB Delft



NEN Standards Products & Services

Postbus 5059
2600 GB Delft

Vlinderweg 6
2623 AX Delft

T (015) 2 690 390
F (015) 2 690 271

www.nen.nl/normshop

Ja, ik bestel

__ ex. NEN-EN-ISO 6974-1:2010 Ontw. en Aardgas - Bepaling van de samenstelling en de daarmee samenhangende onzekerheid - Deel 1: Algemene richtlijnen en de berekening van de samenstelling € 41.62

Wilt u deze norm in PDF-formaat? Deze bestelt u eenvoudig via www.nen.nl/normshop

Gratis e-mailnieuwsbrieven

Wilt u op de hoogte blijven van de laatste ontwikkelingen op het gebied van normen, normalisatie en regelgeving? Neem dan een gratis abonnement op een van onze e-mailnieuwsbrieven. www.nen.nl/nieuwsbrieven

Gegevens

Bedrijf / Instelling _____

T.a.v. _____ O M O V

E-mail _____

Klantnummer NEN _____

Uw ordernummer _____ BTW nummer _____

Postbus / Adres _____

Postcode _____ Plaats _____

Telefoon _____ Fax _____

Factuuradres (indien dit afwijkt van bovenstaand adres)

Postbus / Adres _____

Postcode _____ Plaats _____

Datum _____ Handtekening _____

Retourneren

Fax: 015 2 690 271

E-mail: klantenservice@nen.nl

Post: NEN Standards Products & Services,

t.a.v. afdeling Klantenservice
Antwoordnummer 10214,
2600 WB Delft

(geen postzegel nodig).

Voorwaarden

- De prijzen zijn geldig tot 31 december 2018, tenzij anders aangegeven.
- Alle prijzen zijn excl. btw, verzend- en handelingskosten en onder voorbehoud bij o.m. ISO- en IEC-normen.
- Bestelt u via de normshop een pdf, dan betaalt u geen handeling en verzendkosten.
- Meer informatie: telefoon 015 2 690 391, dagelijks van 8.30 tot 17.00 uur.
- Wijzigingen en typfouten in teksten en prijsinformatie voorbehouden.
- U kunt onze algemene voorwaarden terugvinden op: www.nen.nl/leveringsvoorwaarden.