Petroleum industry and products - Determination of composition of refinery heating gas and calculation of carbon content and calorific value - Gas chromatography method

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NATIONAL FOREWORD

See Eesti standard EVS-EN 15984:2017 sisaldab Euroopa standardi EN 15984:2017 ingliskeelset teksti.	This Estonian standard EVS-EN 15984:2017 consists of the English text of the European standard EN 15984:2017.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 09.08.2017.	Date of Availability of the European standard is 09.08.2017.
Standard on kättesaadav Eesti Standardikeskusest.	The standard is available from the Estonian Centre for Standardisation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

ICS 75.160.30

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 15984

August 2017

ICS 75.160.30

Supersedes EN 15984:2011

English Version

Petroleum industry and products - Determination of composition of refinery heating gas and calculation of carbon content and calorific value - Gas chromatography method

Industries et produits pétroliers - Détermination de la composition des gaz combustibles de raffinerie, de leur pouvoir calorifique et de leur teneur en carbone - Méthode par chromatographie en phase gazeuse

Mineralölindustrie und -produkte - Bestimmung der Zusammensetzung von Heizgas für Raffinerien und Berechnung des Kohlenstoffgehaltes und des Heizwertes - Gaschromatographisches Verfahren

This European Standard was approved by CEN on 19 June 2017.

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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.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
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Ref. No. EN 15984:2017 E

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European foreword

This document (EN 15984:2017) has been prepared by Technical Committee CEN/TC 19 “Gaseous and liquid fuels, lubricants and related products of petroleum, synthetic and biological origin”, the secretariat of which is held by NEN.

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 February 2018, and conflicting national standards shall be withdrawn at the latest by February 2018.

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 15984:2011.

In this revision only the precision values have been updated to reflect the realistic values found in five consecutive interlaboratory studies performed by the DIN/FAM over the years 2009 to 2014. These pooled precision statements were calculated and approved by CEN/TC 19/WG 36.

This document is based on a DIN Standard [3] with the same scope.

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

1 Scope

This European Standard specifies a gas chromatographic analysis for the determination of the composition of fuel gases, as used in refinery heating gas. These results are used to calculate the carbon content and the lower calorific value.

With this gas chromatographic analysis, an overall of 23 refinery heating gas components are determined in concentrations as typically found in refineries (see Table 1 for further details).

Water is not analysed. The results represent dry gases.

NOTE 1 Depending on the equipment used, there is a possibility to determine higher hydrocarbons as well.

NOTE 2 For the purposes of this European Standard, the terms "% (*V/V*)" is used to represent the volume fraction (φ).

WARNING — The use of this standard can involve hazardous materials, operations and equipment. This document does not purport to address all of the safety problems associated with its use. It is the responsibility of users of this standard to take appropriate measures to ensure the safety and health of personnel prior to application of the document, and fulfil statutory and regulatory requirements for this purpose.

2 Principle

This European Standard defines a procedure that is used to determine all components that are present in a typical refinery heating gas, as indicated in Table 1.

The composition range in which each component can be analysed does depend on the actual sample composition as higher amounts of a certain component may affect the detection range of other components eluting close by. The general ranges which apply to all the individual components are:

— hydrocarbons from 0,01 (mol/100 mol) up to 100 (mol/100 mol);

— non-condensable gases from 0,02 (mol/100 mol) up to 100 (mol/100 mol);

— for hydrogen sulfide a range between 0,1 (mol/100 mol) up to 10 (mol/100 mol) has been found applicable.

Three different analysis systems are necessary; they may be built in three separate gas chromatographs, or be integrated into one.

Depending on the configuration, hydrocarbons with more than five carbon atoms are reported as a sum parameter. The composition of the refinery heating gas is used to calculate the carbon content and the calorific value. A typical procedure is described hereafter. A configuration is acceptable when the determination gives the precision as described in Clause 9.

3 Reagents and materials

3.1 Gases.

3.1.1 Hydrogen, with a minimum purity of 99,995 % (*V/V*).

3.1.2 Helium, with a minimum purity of 99,995 % (*V/V*).

3.1.3 Nitrogen, with a minimum purity of 99,995 % (*V/V*).

3.1.4 Air, free of oil and water.