

Liquid petroleum products - Unleaded petrol - Determination of organic oxygenate compounds and total organically bound oxygen content by gas chromatography using column switching

Liquid petroleum products - Unleaded petrol -
Determination of organic oxygenate compounds and
total organically bound oxygen content by gas
chromatography using column switching

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

<p>Käesolev Eesti standard EVS-EN 13132:2000 sisaldab Euroopa standardi EN 13132:2000 ingliskeelset teksti.</p> <p>Käesolev dokument on jõustatud 08.08.2000 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes.</p> <p>Standard on kättesaadav Eesti standardiorganisatsioonist.</p>	<p>This Estonian standard EVS-EN 13132:2000 consists of the English text of the European standard EN 13132:2000.</p> <p>This document is endorsed on 08.08.2000 with the notification being published in the official publication of the Estonian national standardisation organisation.</p> <p>The standard is available from Estonian standardisation organisation.</p>
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<p>Käsitlusala:</p> <p>The European Standard specifies a gas chromatographic method using column switching for the quantitative determination of individual organic oxygenate compounds in the range 0,17 % (m/m) to 15% (m/m) and total organically bound oxygen up 3,7% (m/m) in unleaded petrol having a final boiling point not grater than 220 C.</p>	<p>Scope:</p> <p>The European Standard specifies a gas chromatographic method using column switching for the quantitative determination of individual organic oxygenate compounds in the range 0,17 % (m/m) to 15% (m/m) and total organically bound oxygen up 3,7% (m/m) in unleaded petrol having a final boiling point not grater than 220 C.</p>
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ICS 75.160.20

Võtmesõnad:

ICS 75.160.20

English version

Liquid petroleum products

Unleaded petrol

Determination of organic oxygenate compounds and total organically bound oxygen content by gas chromatography using column switching

Produits pétroliers liquides –
Essence sans plomb – Détermination
des composés oxygénés organiques
et de la teneur totale en oxygène
organique par chromatographie
en phase gazeuse avec commutation
de colonnes

Flüssige Mineralölerzeugnisse –
Unverbleite Ottokraftstoffe –
Bestimmung sauerstoffhaltiger
organischer Verbindungen und
des Gesamtgehaltes an organisch
gebundenem Sauerstoff mittels
Gaschromatographie mit Säulen-
schaltung

This European Standard was approved by CEN on 2000-02-14.

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 Management Centre or to any CEN member.

The European Standards exist 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 Management Centre has the same status as the official versions.

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

CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

Management Centre: rue de Stassart 36, B-1050 Brussels

Foreword

This European Standard has been prepared by Technical Committee CEN/TC 19 "Petroleum products, lubricants and related products", the secretariat of which is held by NNI.

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 2000, and conflicting national standards shall be withdrawn at the latest by September 2000.

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.

In this standard, annex A is normative and annex B is informative.

1 Scope

This European Standard specifies a gas chromatographic method using column switching for the quantitative determination of individual organic oxygenate compounds in the range 0,17 % (m/m) to 15 % (m/m) and total organically bound oxygen up 3,7 % (m/m) in unleaded petrol having a final boiling point not greater than 220 °C.

NOTE 1 The final boiling point can be measured by using prEN ISO 3405:1998 ¹⁾.

NOTE 2 For the purposes of this European Standard, the terms "% (m/m)" and "% (V/V)" are used to represent respectively the mass fraction and the volume fraction.

This European Standard is applicable to the determination of oxygen-containing compounds and total organically bound oxygen in unleaded petrol in line with the relevant EU Directives²⁾.

WARNING The use of this Standard can involve hazardous materials, operations and equipment. This standard does not purport to address all of the safety problems associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

2 Normative references

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 standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN ISO 3170, *Petroleum liquids - Manual sampling (ISO 3170:1988, including Amendment 1:1998)*.

EN ISO 3171, *Petroleum liquids - Automatic pipeline sampling (ISO 3171:1988)*.

EN ISO 3675, *Crude petroleum and liquid petroleum products - Laboratory determination of density - Hydrometer method (ISO 3675:1998)*.

EN ISO 3696, *Water for analytical laboratory use - Specification and test methods (ISO 3696:1987)*.

¹⁾ prEN ISO 3405:1998: Petroleum products - Determination of distillation characteristics at atmosphere pressure (ISO/DIS 3405:1998).

²⁾ EU Directive 85/210/EEC, Council Directive on the approximation of the laws of the Member States concerning the lead content of petrol. EU Directive 85/536/EEC, Council Directive on crude-oil savings through the use of substitute fuel components in petrol.

EN ISO 3838, *Crude petroleum and liquid or solid petroleum products - Determination of density or relative density - Capillary-stoppered pyknometer and graduated bicapillary pyknometer methods (ISO 3838:1983).*

EN ISO 12185, *Crude petroleum and petroleum products - Determination of density - Oscillating U-tube method (ISO 12185:1996).*

3 Principle

Oxygen containing organic compounds are isolated from the sample using a first capillary column. In a second capillary column the oxygen containing organic compounds are separated, and detected individually using a flame ionisation detector.

NOTE Guidance on the column switching technique is given in annex B.

4 Reagents and materials

Use only reagents of recognized analytical grade and water conforming to grade 3 of EN ISO 3696.

4.1 Carrier gas

Hydrogen, helium, or nitrogen, free of hydrocarbons.

WARNING Hydrogen is explosive when mixed with air at concentrations ranging approximately from 4 % (V/V) to 75 % (V/V). All joints and lines carrying hydrogen shall be made gas tight to prevent leakage of hydrogen into a confined space.

4.2 Reagents for the preparation of calibration samples

Reagents shall be not less than 99,0 % (m/m) pure.

Calibration samples may be combinations of the following reagents:

methanol	CH_3OH	methyl alcohol; MEOH;
ethanol	$\text{CH}_3\text{CH}_2\text{OH}$	ethyl alcohol; ETOH;
propan-1-ol	$\text{CH}_3\text{CH}_2\text{CH}_2\text{OH}$	propyl alcohol; NPA;
propan-2-ol	$(\text{CH}_3)_2\text{CHOH}$	iso-propyl alcohol; IPA;
butan-1-ol	$\text{CH}_3[\text{CH}_2]_3\text{OH}$	butyl alcohol; NBA;
butan-2-ol	$\text{CH}_3\text{CH}(\text{OH})\text{CH}_2\text{CH}_3$	sec-butyl alcohol; SBA;
2-methylpropan-2-ol	$(\text{CH}_3)_3\text{COH}$	tert-butyl alcohol; TBA;
2-methylpropan-1-ol	$(\text{CH}_3)_2\text{CHCH}_2\text{OH}$	iso-butyl alcohol; IBA;
pentan-2-ol	$\text{CH}_3\text{CH}(\text{OH})\text{CH}_2\text{CH}_2\text{CH}_3$	sec-amyl alcohol; SAA;
tert-butyl methyl ether	$(\text{CH}_3)_3\text{CO CH}_3$	methyl tertiary butyl ether; MTBE;
methyl tert-pentyl ether	$(\text{CH}_3)_2\text{C}(\text{OCH}_3)\text{CH}_2\text{CH}_3$	tertiary amyl methyl ether; TAME;
ethyl tert-pentyl ether	$(\text{CH}_3)_2\text{C}(\text{OCH}_2\text{CH}_3)\text{CH}_2\text{CH}_3$	ethyl tertiary amyl ether; ETAET;
acetone	$(\text{CH}_3)_2\text{CO}$	
butanone	$\text{CH}_3\text{CH}_2\text{COCH}_3$	methyl ethyl ketone; MEK
tert-butyl ethyl ether	$(\text{CH}_3)_3\text{CO CH}_2\text{CH}_3$	ethyl tertiary butyl ether; ETBE