SLOVENSKI STANDARD
SIST EN 16270:2015

01-september-2015

Nadomešča:
SIST EN 16270:2012

Goriva za motorna vozila - Določevanje komponent z visokim vreliščem, vključno z metilnimi estri maščobnih kislin, v gorivih za motorna vozila, motornem bencinu in etanolu (E85) - Metoda plinske kromatografije

Automotive fuels - Determination of high-boiling components including fatty acid methyl esters in petrol and ethanol (E85) automotive fuel - Gas chromatography method

Kraftstoffe für Kraftfahrzeuge - Bestimmung von hochsiedenden Komponenten in Ottokraftstoff und Ethanol (E85)-Autokraftstoff - Gaschromatographisches Verfahren

Carburants pour automobiles - Détermination des composants haute-bouillantes dans l'essence et dans carburant automobile Ethanol (E85) - Méthode par chromatographie en phase gazeuse

Ta slovenski standard je istoveten z: **EN 16270:2015**

ICS:

75.160.20	Tekoča goriva	Liquid fuels

SIST EN 16270:2015 **en,fr,de**

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 16270

June 2015

ICS 75.160.20

Supersedes EN 16270:2012

English Version

Automotive fuels - Determination of high-boiling components including fatty acid methyl esters in petrol and ethanol (E85) automotive fuel - Gas chromatographic method

Carburants pour automobiles - Détermination des composés à haut point d'ébullition dont les esters méthyliques d'acides gras dans l'essence et dans le carburant éthanol pour automobiles (E85) - Méthode par chromatographie en phase gazeuse

Kraftstoffe für Kraftfahrzeuge - Bestimmung von hochsiedenden Komponenten inklusive Fettsäure-Methylester in Ottokraftstoff und Ethanol (E85)-Kraftstoff für Fahrzeuge - Gaschromatographisches Verfahren

This European Standard was approved by CEN on 30 April 2015.

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, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

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

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

Ref. No. EN 16270:2015 E

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Foreword

This document (EN 16270:2015) 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 December 2015, and conflicting national standards shall be withdrawn at the latest by December 2015.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 16270:2012.

Its scope has been extended to ethanol (E85) automotive fuel, the precision data have been updated and further technical improvements have been included.

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, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

1 Scope

This European Standard specifies a determination method of high boiling components in petrol according to EN 228 [1] and ethanol (E85) automotive fuels according to CEN/TS 15293 [2] by capillary gas chromatography using flame ionization detection. This method is applicable to high boiling material, such as fatty acid methyl ester (FAME) or diesel fuel, having a boiling point greater than or equal to 1-methyl-naphthalene.

This European Standard is applicable to materials having a vapour pressure low enough to permit sampling at ambient temperature and covers a boiling range of at least 100 °C. This method pays special attention to fatty acid methyl esters.

In petrol the measurement range for the high boiling fraction is from about 0,7 % (*m/m*) to about 2,5 % (*m/m*). For the FAME fraction the range is from about 0,2 % (*m/m*) to about 2 % (*m/m*).

In ethanol (E85) automotive fuel the measurement range for the high boiling fraction is from about 0,2 % (*m/m*) to about 2,2 % (*m/m*), for the FAME fraction the range is from about 0,05 % (*m/m*) to about 1,5 % (*m/m*)

NOTE 1 When calculating the FAME fraction, this method only takes the C18 FAME compounds into account.

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.

WARNING —The use of this European Standard may involve hazardous materials, operations and equipment. This European 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 to determine the applicability of regulatory limitations prior to use.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 14214, *Liquid petroleum products - Fatty acid methyl esters (FAME) for use in diesel engines and heating applications - Requirements and test methods*

EN ISO 3170, *Petroleum liquids - Manual sampling (ISO 3170)*

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

3 Terms and definitions

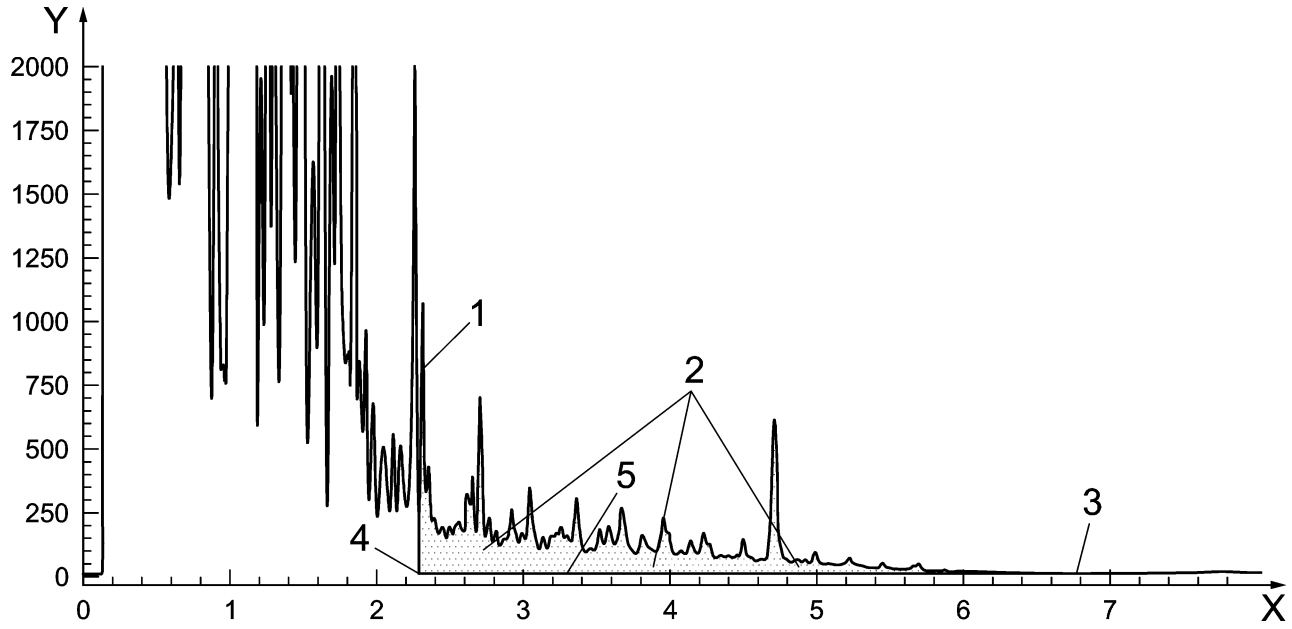
For the purposes of this document, the following terms and definitions apply.

NOTE Figure 1a, 1b and 2 give some visual explanation of the definitions on the basis of an exemplary chromatogram.

3.1
high boiling fraction
total fraction of high boiling material starting from 1-methylnaphthalene until and including dotriacontane and therefore includes all FAME peaks that may be present in this area

3.2
start of high boiling fraction
1-methyl-naphthalene is the first peak to be included in the high boiling fraction

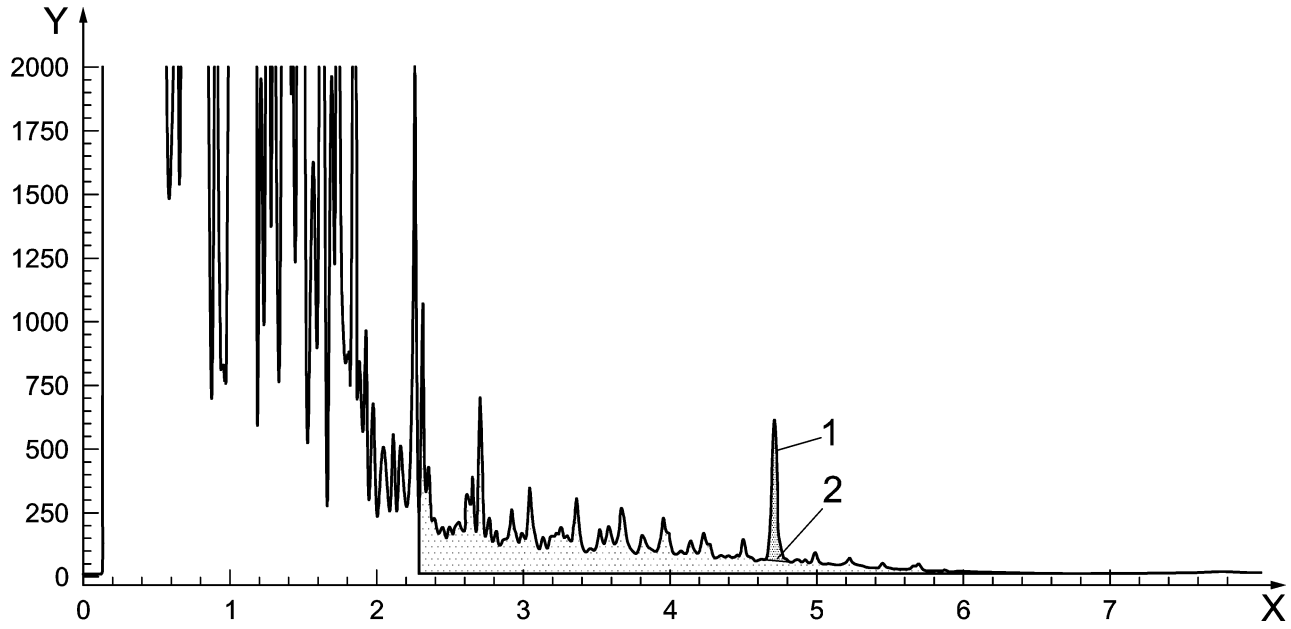
3.3
end of high boiling fraction
dotriacontane (n-C32) is the last peak to be included in the high boiling fraction



Key

1	1-Methyl-naphthalene	4	Start of high boiling fraction
2	Total high boiling area	5	Baseline for high boiling fraction
3	End of high boiling fraction		
X	time (min)	Y	FID signal

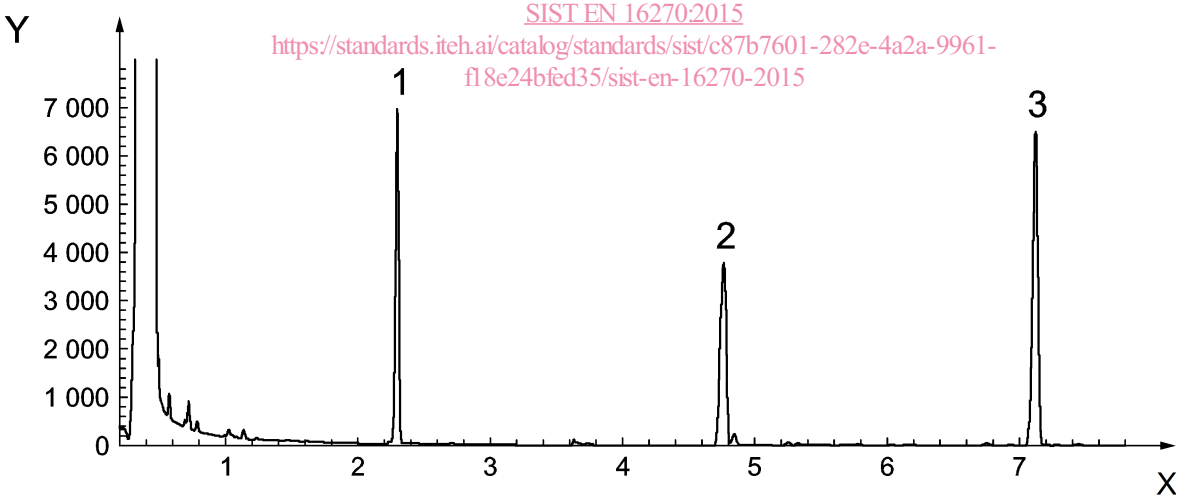
Figure 1a — Chromatogram explaining high boiling fraction



Key

1	C18 FAME peak area	2	Manual baseline for FAME fraction calculation
X	time (min)	Y	FID signal

Figure 1b — Chromatogram explaining FAME fraction



Key

1	1-Methyl-naphthalene – start of high boiling fraction	3	Dotriacontane – end of high boiling fraction
2	C18-FAME		
X	time (min)	Y	FID signal

Figure 2 — Example of a calibration mixture chromatogram

3.4
Fatty acid methyl esters fraction
FAME fraction
combined area of the C18:0, C18:1, C18:2 and C18:3-FAME peaks

Note 1 to entry: The area is defined as shown in Figure 1b

Note 2 to entry: This method only takes the C18 FAME compounds into account as other compounds such as C16:0 can only be present in very limited amounts. In addition, C16:0 co-elutes with an n-paraffin which affects the quantification.

3.5
total high boiling area for a calibration mixture
A_{tc}
sum of the areas of 1-methylnaphthalene and dotriacontane

Note 1 to entry: See Figure 2.

3.6
total FAME area for a calibration mixture
A_{fc}
cumulative area from the start of the FAME C18-fraction until the end of the FAME C18-fraction for a calibration mixture

Note 1 to entry: See Figure 2.

3.7
total high boiling area for a sample

A_s
cumulative area from the start of the high boiling fraction until the end of high boiling fraction for a sample

Note 1 to entry: See Figure 1a.

3.8
total FAME fraction area for a sample
A_f
cumulative area from the start of the FAME C18-fraction until the end of the FAME C18-fraction for a sample

Note 1 to entry: See Figure 1b.

4 Principle

A test portion is introduced into a gas chromatographic column, which separates hydrocarbons in the order of increasing boiling point. The column temperature is raised at a linear reproducible rate and the area under the chromatogram is recorded throughout the analysis. The beginning and the end of the fractions are determined with a calibration mixture.

5 Reagents and materials

Unless otherwise stated, only chemicals of recognized analytical quality shall be used.

5.1 Carrier gases, helium, nitrogen or hydrogen, of at least 99,999 % (*V/V*) purity, any oxygen present should be removed, e.g. by a chemical resin filter.

WARNING — Follow the safety instructions from the filter supplier.

5.2 Hydrogen, grade suitable for flame ionization detectors.