SLOVENSKI STANDARD
SIST EN 15376:2014

01-december-2014

Nadomešča:
SIST EN 15376:2011

Goriva za motorna vozila - Etanol kot komponenta za dodajanje motornemu bencinu - Zahteve in preskusne metode

Automotive fuels - Ethanol as a blending component for petrol - Requirements and test methods

Kraftstoffe für Kraftfahrzeuge - Ethanol zur Verwendung als Blendkomponente in Ottokraftstoff - Anforderungen und Prüfverfahren

Carburants pour automobiles - Ethanol comme constituant d'essence - Exigences et méthodes d'essais

Ta slovenski standard je istoveten z: **EN 15376:2014**

ICS:

71.080.60	Alkoholi. Etri	Alcohols. Ethers
75.160.20	Tekoča goriva	Liquid fuels

SIST EN 15376:2014 **en,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 15376

October 2014

ICS 71.080.60; 75.160.20

Supersedes EN 15376:2011

English Version

Automotive fuels - Ethanol as a blending component for petrol - Requirements and test methods

Carburants pour automobiles - Ethanol comme base de mélange à l'essence - Exigences et méthodes d'essais

Kraftstoffe für Kraftfahrzeuge - Ethanol zur Verwendung als Blendkomponente in Ottokraftstoff - Anforderungen und Prüfverfahren

This European Standard was approved by CEN on 6 September 2014.

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Ref. No. EN 15376:2014 E

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Foreword

This document (EN 15376:2014) 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of an identical text or by endorsement, at the latest by April 2015 and conflicting national standards shall be withdrawn at the latest by April 2015.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 15376:2011.

This document has originally been prepared under mandate M/344 given to CEN by the European Commission and the European Free Trade Association along with other standards intended to be complementary to the regulatory measures contained in various EU Directives, see [1], [2], [3] and [4].

If (bio)ethanol is meant for use as automotive fuel component, this document applies. It is intended to call up this European Standard in EN 228 [5], in order to define the quality of (bio)ethanol which is added/blended to the petrol.

The major updates of this third version concern the inclusion of newly developed methods for determination of inorganic chloride and sulfate, plus the lowering of their respective limits. As experience with ICP-OES instruments in the market has grown, EN 15837 has become the method in case of dispute for copper and sulfur content.

The former version gave all relevant characteristics, requirements and test methods for (bio)ethanol, which were known at that time to be necessary to define the product to be used up to a maximum 10 % (*V/V*) blending component for automotive petrol fuel. With the actual document, the percentage of use is expanded to allow use at all percentages up to and including 85 % (*V/V*) and the requirements are updated accordingly.

According to the CEN-CENELEC Internal Regulations, the national standards organizations 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 requirements and test methods for marketed and delivered ethanol to be used as an extender for automotive fuel for petrol engine vehicles in accordance with the requirements of EN 228 [5]. It is applicable to ethanol used for blending at all levels up to and including 85 % (*V/V*).

NOTE For the purposes of this document, the term "% (*m/m*)" and "% (*V/V*)" are used to represent the mass fraction, *μ*, and the volume fraction, *φ,* respectively.

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 15485:2007, *Ethanol as a blending component for petrol — Determination of sulfur content — Wavelength dispersive X-ray fluorescence spectrometric method*

EN 15486:2007, *Ethanol as a blending component for petrol — Determination of sulfur content — Ultraviolet fluorescence method*

EN 15487:2007, *Ethanol as a blending component for petrol — Determination of phosphorus content — Ammonium molybdate spectrometric method*

EN 15488:2007, *Ethanol as a blending component for petrol — Determination of copper content — Graphite furnace atomic absorption spectrometric method*

EN 15489:2007, *Ethanol as a blending component for petrol — Determination of water content — Karl Fischer coulometric titration method*

EN 15491:2007, *Ethanol as a blending component for petrol — Determination of total acidity — Colour indicator titration method*

EN 15492:2012, *Ethanol as a blending component for petrol — Determination of inorganic chloride and sulfate content — Ion chromatographic method*

EN 15691:2009, *Ethanol as a blending component for petrol — Determination of dry residue (involatile material) — Gravimetric method*

EN 15692:2009, *Ethanol as a blending component for petrol — Determination of water content — Karl Fischer potentiometric titration method*

EN 15721:2013, *Ethanol as a blending component for petrol — Determination of higher alcohols, methanol and other impurities — Gas chromatographic method*

EN 15769:2009, *Ethanol as a blending component of petrol — Determination of appearance — Visual method*

EN 15837:2009, *Ethanol as a blending component for petrol — Determination of phosphorus, copper and sulfur content — Direct method by inductively coupled plasma optical emission spectrometry (ICP OES)*

EN 15938:2010, *Automotive fuels — Ethanol blending component and ethanol (E85) automotive fuel — Determination of electrical conductivity*

EN ISO 3170:2004, *Petroleum liquids — Manual sampling (ISO 3170:2004)*

EN ISO 4259:2006, *Petroleum products — Determination and application of precision data in relation to methods of test (ISO 4259:2006)*

3 Sampling

Samples shall be taken as described in EN ISO 3170 and/or in accordance with the requirements of national standards or regulations for the sampling of alcohol. The national requirements shall be set out in detail or shall be referred to by reference in a national annex to this European Standard.

In view of the sensitivity of some of the test methods referred to in this European Standard, particular attention shall be paid to compliance with any guidance on sampling containers included in the test method standard.

4 Requirements and test methods

4.1 Dyes and markers

The use of dyes or markers is allowed.

4.2 Additives

For distribution purposes, it is recommended that ethanol producers and downstream distributors and petrol blenders consider the need to add anti-corrosion additives to fuel grade ethanol. Suitable fuel additives without known harmful side effects and that are compatible with the finished petrol are recommended in the appropriate amount. These should not infringe patents through commingling.

4.3 Denaturing

Denaturants, as required by European and national customs regulations are permitted, provided they do not cause harmful side effects to vehicles and petroleum distribution systems.

Where denaturing of the automotive ethanol is required, it is strongly recommended to select denaturants from the list below that are known to be non-harmful to vehicle systems:

— automotive petrol conforming to EN 228,

— Ethyltertbutylether (ETBE),

— Methyltertbutylether (MTBE),

— Tertiary Butyl Alcohol (TBA),

— 2-methyl-1-propanol (isobutanol) and

— 2-propanol (isopropanol).

Any or all of these denaturants may be used alone or together, except isobutanol and isopropanol that are easily removed, so it is advisable to use them in combination with another denaturant.

The concentration of denaturant(s) is at the discretion of national authorities and should not be in contradiction with EN 228 requirements.

4.4 Generally applicable requirements and related test methods

4.4.1 When tested by the methods indicated in Table 1, ethanol before denaturing shall be in accordance with the limits specified in Table 1.

Table 1 — Generally applicable requirements and test methods for undenatured ethanol

Property	Unit	Limits		Test method [a]
		minimum	maximum	(See Clause 2)
Ethanol + higher saturated alcohols content	% (*m/m*)	98,7		EN 15721 [b]
Higher saturated (C3-C5) mono-alcohols content [c]	% (*m/m*)		2,0	EN 15721 [b]
Methanol content	% (*m/m*)		1,0	EN 15721 [b]
Water content [d]	% (*m/m*)		0,300	EN 15489 EN 15692
Total acidity (expressed as acetic acid)	% (*m/m*)		0,007	EN 15491
Electrical conductivity [e]	µS/cm		2,5	EN 15938
Appearance		clear and colourless		EN 15769
Inorganic chloride content	mg/kg		1,5	EN 15492
Sulfate content	mg/kg		3,0	EN 15492
Copper content [f]	mg/kg		0,100	EN 15488 EN 15837
Phosphorus content [g]	mg/l		0,15	EN 15487 EN 15837
Involatile material content	mg/100 ml		10	EN 15691
Sulfur content [f]	mg/kg		10,0	EN 15485 EN 15486 EN 15837

a See 4.6.1.

b The result of this test method refers to the water free sample.

c Higher saturated alcohols have the chemical formula $C_nH_{2n+1}OH$, where n is 3, 4 or 5.

d See 4.6.2.

e To be measured prior to additivation.

f See 4.6.3.

g See 4.6.4.

4.4.2 In case of a need for identification of the biological origin of ethanol, a traceable record of biological origin is the recommended method.

An alternative is age determination, which is based on the beta(minus) decay of the radioactive carbon isotope C-14 [6]. This method is considered too laborious for frequent testing, but it may be considered as a useful tool to determine cases where the audit trail approach is contested.

4.5 Climate dependent requirements

Given the known potential for ethanol to absorb water, suppliers shall ensure that no water segregation occurs under the range of climatic and fuel distribution conditions experienced in the country concerned.

4.6 Precision and dispute

4.6.1 All test methods referred to in this European Standard include a precision statement according to EN ISO 4259. In cases of dispute, the procedures for resolving the dispute and interpretation of the results based on test method precision, described in EN ISO 4259, shall be used.

4.6.2 In cases of dispute concerning water content, EN 15489 shall be used.

4.6.3 In cases of dispute concerning copper or sulfur content, EN 15837 shall be used. See also [7].

4.6.4 In cases of dispute concerning phosphorus content, EN 15487 shall be used. See also [7].