SLOVENSKI STANDARD
SIST EN 15376:2008+A1:2009

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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 base de mélange à l'essence - Exigences et méthodes d'essais

Ta slovenski standard je istoveten z: **EN 15376:2007+A1:2009**

ICS:

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

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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

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

Management Centre: Avenue Marnix 17, B-1000 Brussels

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Foreword

This document (EN 15376:2007+A1:2009) 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of an identical text or by endorsement, at the latest by February 2010, and conflicting national standards shall be withdrawn at the latest by February 2010.

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 includes Amendment 1, approved by CEN on 2009-07-20.

This European Standard supersedes EN 15376:2007.

The start and finish of text introduced or altered by amendment is indicated in the text by tags ⟨A1⟩ ⟨A1⟩.

This document has 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 [1], [2] and [3].

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, in order to define the quality of (bio)ethanol which is added/blended to the petrol.

Some of the test methods included in this document are the subject of inter-laboratory testing to determine the applicability of the method and its precision in relation to different sources of ethanol. At this moment in time, some precision statements are yet unknown and identified test methods and limits may change in future revisions of this document.

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, 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.

1 Scope

This document 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.

NOTE 1 This document gives all relevant characteristics, requirements and test methods for (bio)ethanol, which are known at this time to be necessary to define the product to be used up to a maximum 5 % (*V/V*) blending component for automotive petrol fuel. If the percentage or use is expanded, the requirements need to be restudied.

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

2 Normative references

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

[A1› EN 228, *Automotive fuels — Unleaded petrol — Requirements and test methods*

EN 15484, *Ethanol as a blending component for petrol — Determination of inorganic chloride — Potentiometric method*

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

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

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

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

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

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

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

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

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

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

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

EN ISO 4259, *Petroleum products — Determination and application of precision data in relation to methods of test (ISO 4259:2006)* ‹A1]

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 document.

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

It is essential that for sampling of ethanol the containers used to take and store the samples before testing are not contaminated with water and/or sulfur.

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.

NOTE The concentration of denaturant(s) is at the discretion of national authorities and should not contradict 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. The test methods listed in Table 1 have been shown to be applicable to ethanol

in an interlaboratory test programme [4]. Precision data from this programme are incorporated in the test method.

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

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Property	Unit	Limits		Test method [a]
		minimum	maximum	
Ethanol content + higher saturated alcohols	% (*m/m*)	98,7		EN 15721
Higher saturated (C3 - C5) mono-alcohols content	% (*m/m*)		2,0	EN 15721
Methanol content	% (*m/m*)		1,0	EN 15721
Water content	% (*m/m*)		0,300	EN 15489 [b]
Inorganic chloride content	mg/l		20,0	EN 15484 or EN 15492 [c]
Copper content	mg/kg		0,100	EN 15488
Total acidity (expressed as acetic acid)	% (*m/m*)		0,007	EN 15491
Appearance		clear and colourless		EN 15769
Phosphorus content	mg/l		0,50	EN 15487
Involatile material content	mg/100ml		10	EN 15691
Sulfur content	mg/kg		10,0	EN 15485 or EN 15486 [d]

a See 4.4.1.

b A cross check validation showed that a Karl Fischer volumetric method [5] is also applicable, but in cases of dispute the indicated method shall be used.

c See 4.6.2.

d See 4.6.2. These methods have special provisions for ethanol which are not incorporated in the usual petroleum test methods such as EN ISO 20846 [6] and EN ISO 20884 [7].

NOTE 1 A maximum sulfate content limit will be added in a future revision of this document.

NOTE 2 To adequately limit the strong acidity and the alkaline substance, which cannot be sufficiently determined via pHe [8], test method(s) are under development in CEN and a limit will be added once test method standards have been published.

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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.

NOTE An alternative is age determination, which is based on the beta(minus) decay of the radioactive carbon isotope C-14 [9]. 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 and related test methods

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 document 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 sulfur or inorganic chloride content, interlaboratory testing [4] has not identified statistical differences in precision at the specified levels.

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