

English Version

Automotive fuels - Ethanol (E85) automotive fuel - Background to the parameters required and their respective limits and determination

Carburants pour automobiles - Ethanol (E85)
carburants pour automobiles - Historique sur la
définition des paramètres requis, de leurs limites et de
leur détermination respectives

Kraftstoffe für Kraftfahrzeuge - Ethanol (E85)
Fahrzeugkraftstoff - Hintergrund über die geforderten
Parameter und ihre entsprechenden Grenzen und
Bestimmung

This Technical Report was approved by CEN on 8 February 2018. It has been drawn up by the Technical Committee CEN/TC 19.

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, Serbia, 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: Rue de la Science 23, B-1040 Brussels

Contents

Page

European foreword.....	3
1 Scope	4
2 Normative references	4
3 Summary	6
4 Historical context.....	6
5 Task Forces.....	7
5.1 The Ethanol (E85) automotive fuel Task Force.....	7
5.2 The Ethanol Fuel Task Force	9
6 The ethanol (E85) automotive fuel specification	12
6.1 Parameters included.....	12
6.2 Considerations on the parameters	15
6.2.1 Denaturants	15
6.2.2 RON/MON	15
6.2.3 Ethanol content and higher alcohols.....	16
6.2.4 Vapour pressure	18
6.2.5 Density	19
6.2.6 Sulfur content	19
6.2.7 Oxidation stability	20
6.2.8 Oxygenates content	21
6.2.9 Phosphorus.....	23
6.2.10 Water content.....	24
6.2.11 Inorganic Chloride content.....	25
6.2.12 Copper strip corrosion	26
6.2.13 Total acidity	26
6.2.14 Sulfate content	26
6.2.15 Conductivity	28
6.2.16 Additives.....	29
6.2.17 Appearance.....	29
6.2.18 Biologically sourced ethanol.....	29
6.2.19 Guidelines	30
6.3 Parameters considered and not included (anymore) in the draft specification.....	30
6.3.1 Existent gum content (solvent washed).....	30
6.3.2 Copper content.....	30
6.3.3 pHe.....	31
6.3.4 High boiling components.....	31
6.3.5 Chlorine as chlorides	32
6.3.6 Lead.....	32
7 Acknowledgements	32
Bibliography.....	33

European foreword

This document (CEN/TR 15993:2018) 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.

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 CEN/TR 15993:2013.

The original Technical Report presented all decisions that led to CEN/TS 15293:2011 [1], when it was developed from its predecessor [2]. This document now includes all decisions that have been made within the Ethanol Fuel Task Force since 2011, following comments and further investigations leading to the draft ethanol (E85) automotive fuel specification as a proposed European Standard prEN 15293:2017.

1 Scope

This Technical Report explains the requirements and test methods for marketed and delivered ethanol (E85) automotive fuel according to EN 15293. It provides background information on the final text of the draft European standard and gives guidance and explanations to the producers, blenders, marketers and users of ethanol (E85) automotive fuel.

It is applicable to ethanol (E85) for use in spark ignition engine vehicles designed to run on ethanol (E85). Ethanol (E85) is a mixture of nominally 85 % ethanol and 15 % petrol, but it also includes the possibility of having different 'seasonal grades' containing 50 % or more ethanol.

NOTE 1 This document is directly related to prEN 15293:2017 and will be updated if further revisions to the standard take place.

NOTE 2 For the purposes of this document, the terms “% (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 are referred to in the text in such a way that some or all of their content constitutes requirements 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.

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

EN 1601:1997, *Liquid petroleum products — Unleaded petrol — Determination of organic oxygenate compounds and total organically bound oxygen content by gas chromatography (O-FID)*

EN 13016-1, *Liquid petroleum products — Vapour pressure — Part 1: Determination of air saturated vapour pressure (ASVP) and calculated dry vapour pressure equivalent (DVPE)*

EN 13016-3, *Liquid petroleum products — Vapour pressure — Part 3: Determination of vapour pressure and calculated dry vapour pressure equivalent (DVPE) (Triple Expansion Method)*

CEN/TS 15293:2011, *Automotive fuels — Ethanol (E85) automotive fuel — Requirements and test methods*

prEN 15293:2017, *Automotive fuels — Ethanol (E85) automotive fuel — Requirements and test methods*

EN 15376, *Automotive fuels — Ethanol as a blending component for petrol — Requirements and test methods*

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 coulometric titration method*

EN 15490, *Ethanol as a blending component for petrol — Determination of pH_e*

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 15691:2009, *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, *Ethanol as a blending component of petrol — Determination of appearance — Visual method*

EN 16270:2015, *Automotive fuels — Determination of high-boiling components including fatty acid methyl esters in petrol and ethanol (E85) automotive fuel — Gas chromatographic method*

EN 16761-1, *Automotive fuels — Determination of methanol in automotive ethanol (E85) fuel by gas chromatography — Part 1: Method using single column technique*

EN 16761-2, *Automotive fuels — Determination of methanol in automotive ethanol (E85) fuel by gas chromatography — Part 2: Method using heart cut technique*

EN ISO 2160, *Petroleum products — Corrosiveness to copper — Copper strip test (ISO 2160)*

EN ISO 3405:2000, *Petroleum products — Determination of distillation characteristics at atmospheric pressure (ISO 3405:2000)*

EN ISO 5163, *Petroleum products — Determination of knock characteristics of motor and aviation fuels — Motor method (ISO 5163)*

EN ISO 5164, *Petroleum products — Determination of knock characteristics of motor fuels — Research method (ISO 5164)*

EN ISO 7536, *Petroleum products — Determination of oxidation stability of gasoline — Induction period method (ISO 7536)*

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

EN ISO 22854, *Liquid petroleum products — Determination of hydrocarbon types and oxygenates in automotive-motor gasoline and in ethanol (E85) automotive fuel — Multidimensional gas chromatography method (ISO 22854)*