

Automotive fuels - Ethanol blending component and ethanol (E85) fuel - Determination of electrical conductivity

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN 15938:2010 sisaldab Euroopa standardi EN 15938:2010 ingliskeelset teksti.

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ICS 75.160.20

English Version

**Automotive fuels - Ethanol blending component and ethanol
(E85) automotive fuel - Determination of electrical conductivity**

Carburants pour automobiles - Éthanol comme base de
mélange à l'essence et carburant éthanol (E85) pour
automobiles - Détermination de la conductivité électrique

Kraftstoffe für Kraftfahrzeuge - Ethanol als
Blendkomponente und Ethanolkraftstoff (E85) -
Bestimmung der elektrischen Leitfähigkeit

This European Standard was approved by CEN on 7 August 2010.

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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 Management Centre has the same status as the official versions.

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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 15983:2010) 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of an identical text or by endorsement, at the latest by March 2011, and conflicting national standards shall be withdrawn at the latest by March 2011.

This document was prepared by CEN/TC 19 — Ethanol Task Force under responsibility of its Working Group 21 and is based on DIN 51627-4 [1].

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, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

1 Scope

This European Standard specifies a test method for the determination of the electrical conductivity in ethanol and ethanol (E85) automotive fuel in the range from approximately (0,3 to 5) $\mu\text{S}/\text{cm}$ at a temperature of 25 °C (see Clause 4). The electrical conductivity is determined from the measured electrical conductance.

The electrical conductivity is an important analytical criterion for the ascertainment and control of anionic and cationic components in ethanol and ethanol (E85) automotive fuel. Some of these components can exhibit corrosive properties.

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.

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

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

3 Terms and definitions

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

3.1

electrical conductance

G

reciprocal value of the electrical resistance

NOTE The electrical conductance is expressed in siemens (S) or Ω^{-1} .

3.2

electrical resistance

R

measurement value of a sample, directly determined by means of the conductivity meter, which increases with the sample length l and decreases with the sample cross-section A

NOTE The electrical resistance of a sample is expressed in ohms (Ω). The relation between R and the electrical conductance (3.1) is shown in Equation (1).

$$G = \frac{1}{R} \quad (1)$$

3.3

electrical conductivity

σ_T

material-dependent measure of the electrical current conducted in an electrical field by the ions present in the solution

NOTE 1 The material-dependent electrical conductivity of a solution is related to the electrical current which is achieved by moving ions of the solution in an electrical field. It is therefore applicable as a method to limit ionic contamination in alcohols and alcohol based fuels. The electrical conductivity σ_T is determined in accordance with Equation (2) from the determined electrical conductance G (3.1) and the geometrical dimensions of the measuring cell (length and effective cross-section) which are added to form the cell constant K (3.4):