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I.S. EN 15692:2009

Ethanol as a blending component for petrol - Determination of water content - Karl Fischer potentiometric titration method

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English Version

Ethanol as a blending component for petrol - Determination of water content - Karl Fischer potentiometric titration method

Ethanol comme base de mélange à l'essence - Détermination de la teneur en eau - Méthode de titrage potentiométrique Karl Fischer

Ethanol zu Verwendung als Blendkomponente in Ottokraftstoff - Bestimmung des Wassergehaltes - Potentiometrische Titration nach Karl Fischer

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EUROPEAN COMMITTEE FOR STANDARDIZATION
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Foreword

This document (EN 15692:2009) 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of an identical text or by endorsement, at the latest by October 2009, and conflicting national standards shall be withdrawn at the latest by October 2009.

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 was prepared by CEN/TC 19’s Ethanol Task Force under its Working Group 21 and is based on ISO 760 [1]. It is developed as an alternative to EN 15489 [2], delivering a method more widely used in the alcohol and beverage industry environment.

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 the United Kingdom.

1 Scope

This European standard specifies a method for the direct determination of water in ethanol to be used in gasoline blends. It is applicable in the range 0,05 % (*m/m*) to 0,54 % (*m/m*).

NOTE For the purposes of this European Standard, the term "% (*m/m*)" is used to represent the mass fraction.

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

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 3696, *Water for analytical laboratory use – Specification and test methods (ISO 3696:1987)*

3 Terms and definitions

For the purposes of this European Standard, the following term and definition applies.

3.1
water content
content of water determined by potentiometric Karl Fischer procedure as given in this document

4 Principle

A weighed test portion is injected into the titration vessel of a potentiometric Karl Fischer apparatus. The water present is titrated to a potentiometric end point using Karl Fischer reagent. Iodine (I_2), with presence of anhydride sulfur (SO_2), of methanol (CH_3OH) and of an appropriate nitrogen base (RN), is introduced for the Karl Fischer reaction. Based on the stoichiometry of the reaction, one mole of iodine reacts with one mole of water.

The reaction can be expressed as follows:

$CH_3OH + SO_2 + RN \rightarrow [RNH]SO_3CH_3$

$H_2O + I_2 + [RNH]SO_3CH_3 + 2RN \rightarrow [RNH]SO_4CH_3 + 2[RNH]I$

5 Reagents and materials

Use only chemicals and reagents of recognized analytical grade.

5.1 Karl Fischer reagent, pyridine-free Karl Fischer reagent, containing iodine, sulfur dioxide and a odourless amine and with a nominal water equivalent content of either 2 mg or 5 mg water per ml equivalent.

The Karl Fisher reagent shall be standardized daily before use (see 8.1).