NSAI Standards

Irish Standard
I.S. EN 15692:2021

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

I.S. EN 15692:2021

Incorporating amendments/corrigenda/National Annexes issued since publication:

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This document is based on:	*Published:*
EN 15692:2021	2021-07-21

This document was published under the authority of the NSAI and comes into effect on:	ICS number:
2021-08-09	75.160.20
	NOTE: If blank see CEN/CENELEC cover page

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National Foreword

I.S. EN 15692:2021 is the adopted Irish version of the European Document EN 15692:2021, Ethanol as a blending component for gasoline - Determination of water content - Karl Fischer potentiometric titration method

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 15692

July 2021

ICS 75.160.20

Supersedes EN 15692:2009

English Version

Ethanol as a blending component for gasoline - 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 Karl Fischer par titrage potentiométrique

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

This European Standard was approved by CEN on 14 June 2021.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
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EUROPÄISCHES KOMITEE FÜR NORMUNG

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Ref. No. EN 15692:2021 E

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European foreword

This document (EN 15692:2021) 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of an identical text or by endorsement, at the latest by January 2022, and conflicting national standards shall be withdrawn at the latest by January 2022.

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 EN 15692:2009.

In comparison with the previous edition, the following technical modifications have been made:

— The original 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.

— The test method has been revised in terms of its precision and scope. A second interlaboratory study (ILS) in 2010 [5] confirmed the application to automotive ethanol (E85) fuel. Use of the method over time, especially in proficiency testing programmes, gave questions around whether the precision in the original document. When CEN/TC 19/WG 36 was requested to study the ILS reports, the recalculated precision results did not reflect the published precision.

— The newly calculated precision is lower than the one published and the statistics allow introducing a constant reproducibility for the determination of water content in ethanol. The test method lower limit could remain at 0,05 % (whereas the lowest sample mean was 0,02 %). So the scope range has not been changed, but the precision calculations have.

Any feedback and questions on this document should be directed to the users’ national standards body. A complete listing of these bodies can be found on the CEN website.

According to the CEN-CENELEC Internal Regulations, the national standards organisations 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, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

1 Scope

This document specifies a method for the direct determination of water in ethanol to be used as a blending component for petrol, as well as in automotive ethanol (E85) fuel.

This method is applicable in the range 0,05 % (*m/m*) to 0,54 % (*m/m*).

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

WARNING — Use of this document might involve hazardous materials, operations and equipment. This document does not purport to address all of the safety problems associated with its use. It is the responsibility of the user of this document to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

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 ISO 3170, *Petroleum liquids - Manual sampling (ISO 3170)*

EN ISO 3696, *Water for analytical laboratory use - Specification and test methods (ISO 3696)*

3 Terms and definitions

For the purposes of this document, the following term and definition apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at https://www.electropedia.org/
- ISO Online browsing platform: available at https://www.iso.org/obp

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:

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

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