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National Standards Authority of Ireland

STANDARD

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LIQUID PETROLEUM PRODUCTS - DETERMINATION OF FATTY ACID METHYL ESTERS (FAME) IN MIDDLE DISTILLATES - INFRARED SPECTROSCOPY METHOD

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English version

Liquid petroleum products - Determination of fatty acid methyl esters (FAME) in middle distillates - Infrared spectroscopy method

Produits pétroliers liquides - Détermination de la teneur en esters méthyliques d'acides gras (EMAG) des distillats moyens - Méthode par spectrométrie infrarouge

Flüssige Mineralölprodukte - Bestimmung von Fettsäure-Methylester (FAME) in Mitteldestillaten - Infrarotspektrometrisches Verfahren

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Foreword

This document EN 14078:2003 has been prepared by CEN/TC 19, "Petroleum products, lubricants and related products", 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of an identical text or by endorsement, at the latest by June 2004, and conflicting national standards shall be withdrawn at the latest by June 2004.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard : Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and the United Kingdom.

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1 Scope

This European Standard specifies a test method for the determination of Fatty Acid Methyl Ester (FAME)content in diesel fuel or domestic heating fuel by mid infrared spectrometry in the range from about 1,7 % *(V/V)* to 22,7 % *(V/V)*. Other FAME contents can also be analyzed in principle, however, no precision data for results outside the specified range are available at this time.

The test method has been verified to be applicable to samples which contain FAME conforming to the European specifications EN 14214 or EN 14213. Reliable quantitative results are obtained only when the samples do not contain significant amounts of other interfering components, especially esters, which possess absorption bands in the spectral region used for quantification of FAME. When such interfering components are present, this test method is expected to produce higher values

NOTE 1 When interfering components are suspected to be present, it is recommended for cases of doubt or dispute to record the full infrared spectrum and to compare it to spectra of samples with well known FAME contents.

NOTE 2 For the purposes of this European Standard, the term "% *(V/V)*" is used to represent the volume fraction of a material.

NOTE 3 For conversion of g/l to % *(V/V)*, a fixed density of FAME of 880,0 kg/m^3 is adopted.

Warning – The 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

This European Standard incorporates, by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text, and the publications are listed thereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references, the latest edition of the publication referred to applies (including amendments).

EN 14213, *Heating fuels - Fatty acid methyl esters (FAME) - Requirements and test methods.*

EN 14214, *Automotive fuels – Fatty acid methyl esters (FAME) for diesel engines – Requirements and test methods.*

EN ISO 3170, *Petroleum liquids – Manual sampling (ISO 3170:1988, including Amendment 1:1998).*

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

3 Principle

The mid infrared absorption spectrum of a test portion of a sample which has been diluted as appropriate with cyclohexane, is recorded. The absorbance at the peak maximum of the typical absorption band for esters at about 1 745 cm^{-1} ± 5 cm^{-1} is measured. The FAME content is then calculated with a calibration function produced from standard solutions with a known FAME content.

4 Reagents and materials

4.1 FAME for calibration

FAME as specified in EN 14214 or EN 14213

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