

Automotive fuels — Fatty acid methyl esters (FAME) for diesel engines — Requirements and test methods

ICS 75.160.20

National foreword

This British Standard is the UK implementation of EN 14214:2008+A1:2009. It supersedes BS EN 14214:2008 which is withdrawn.

The start and finish of text introduced or altered by amendment is indicated in the text by tags. Tags indicating changes to CEN text carry the number of the CEN amendment. For example, text altered by CEN amendment A1 is indicated by **A1** **A1**.

The UK participation in its preparation was entrusted to Technical Committee PTI/2, Liquid fuels.

A list of organizations represented on this committee can be obtained on request to its secretary.

The UK National Annex NA gives the sampling requirements to comply with Clause 3. The UK National Annex NB gives the pump marking requirements to comply with Clause 4, and the UK National Annex NC gives the climate dependent requirements to comply with 5.5.3.

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Date	Comments
28 February 2010	Implementation of CEN amendment A1:2009
28 February 2010	Insertion of missing National Annex

English Version

Automotive fuels - Fatty acid methyl esters (FAME) for diesel engines - Requirements and test methods

Carburants pour automobiles - Esters méthyliques d'acides gras (EMAG) pour moteurs diesel - Exigences et méthodes d'essai

Kraftstoffe für Kraftfahrzeuge - Fettsäure-Methylester (FAME) für Dieselmotoren - Anforderungen und Prüfverfahren

This European Standard was approved by CEN on 25 October 2008 and includes Amendment 1 approved by CEN on 5 October 2009.

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Foreword

This document (EN 14214:2008+A1:2009) 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of an identical text or by endorsement, at the latest by May 2010, and conflicting national standards shall be withdrawn at the latest by May 2010.

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 includes Amendment 1, approved by CEN on 2009-10-05.

This document supersedes A1 EN 14214:2008 A1.

The start and finish of text introduced or altered by amendment is indicated in the text by tags A1 A1.

This European Standard exists in parallel with EN 590.

Significant technical changes between this European Standard and the previous edition are:

- suitable limits and test methods on the esters, glycerides and stability characteristics of FAME resulting from EU-funded research programmes ‘BIOSTAB’ and ‘BIOScopes’ have been incorporated, although a possible replacement for iodine value is still under discussion in CEN/TC 19;
- the phosphorus limit has been lowered from 10 ppm to 4 ppm, as a first reasonable step towards meeting the needs of the latest technology engines, being a measurable amount and achievable with not too large investments by the FAME producers;
- allowance of the automatic Pensky-Martens test method as an alternative for flash point determination and a corresponding change of the limit from 120 °C to 101 °C;
- addition of a workmanship subclause (5.4.5);
- inclusion of a note referring to good house keeping via CEN/TR 15367-1;
- a note to clarify that cold flow requirements of fatty acid methyl esters (FAME) when used as an extender for diesel according to EN 590 (as set out in Table 2) do not apply;
- a general update of the revised test methods, some of them already having been included in the Technical Corrigendum to the previous version.

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 United Kingdom.

Introduction

This European Standard gives all relevant characteristics, requirements and test methods for fatty acid methyl esters (FAME), which are known at this time to be necessary to define the product to be used as automotive diesel fuel.

Many of the test methods included in this European Standard were the subject of interlaboratory testing to determine their applicability and their precision in relation to different sources of FAME. These FAME were produced from vegetable oils available in the market at that time, i.e. rapeseed, palm, soy and sunflower oil.

Concerning total contamination, an interlaboratory study with field samples, following a study with artificial samples, is pending and therefore the repeatability and reproducibility of EN 12662 have not yet been fully established. The precision for volume percentage levels of FAME of 7, 10 and 100 will be investigated.

1 Scope

This European Standard specifies requirements and test methods for marketed and delivered fatty acid methyl esters (hereafter known as FAME) to be used either as automotive fuel for diesel engines at 100 % concentration, or as an extender for automotive fuel for diesel engines in accordance with the requirements of EN 590. At 100 % concentration it is applicable to fuel for use in diesel engine vehicles designed or subsequently adapted to run on 100 % FAME.

NOTE For the purposes of this European Standard, the terms “% (m/m)” and “% (V/V)” are used to represent respectively the mass fraction and the volume fraction.

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 116:1997, *Diesel and domestic heating fuels — Determination of cold filter plugging point*

EN 590, *Automotive fuels — Diesel — Requirements and test methods*

EN 12662:2008, *Liquid petroleum products — Determination of contamination in middle distillates*

EN 14103:2003, *Fat and oil derivatives — Fatty Acid Methyl Esters (FAME) — Determination of ester and linolenic acid methyl ester contents*

EN 14104:2003, *Fat and oil derivatives — Fatty Acid Methyl Esters (FAME) — Determination of acid value*

EN 14105:2003, *Fat and oil derivatives — Fatty Acid Methyl Esters (FAME) — Determination of free and total glycerol and mono-, di- and triglyceride content (Reference method)*

EN 14106:2003, *Fat and oil derivatives — Fatty Acid Methyl Esters (FAME) — Determination of free glycerol content*

EN 14107:2003, *Fat and oil derivatives — Fatty Acid Methyl Esters (FAME) — Determination of phosphorus content by inductively coupled plasma (ICP) emission spectrometry*

EN 14108:2003, *Fat and oil derivatives — Fatty Acid Methyl Esters (FAME) — Determination of sodium content by atomic absorption spectrometry*

EN 14109:2003, *Fat and oil derivatives — Fatty Acid Methyl Esters (FAME) — Determination of potassium content by atomic absorption spectrometry*

EN 14110:2003, *Fat and oil derivatives — Fatty Acid Methyl Esters (FAME) — Determination of methanol content*

EN 14111:2003, *Fat and oil derivatives — Fatty Acid Methyl Esters (FAME) — Determination of iodine value*

EN 14112:2003, *Fat and oil derivatives — Fatty Acid Methyl Esters (FAME) — Determination of oxidation stability (accelerated oxidation test)*

EN 14538:2006, *Fat and oil derivatives — Fatty acid methyl esters (FAME) — Determination of Ca, K, Mg and Na content by optical emission spectral analysis with inductively coupled plasma (ICP OES)*

EN 15751:2009 ^{A1}, *Automotive fuels — Fatty acid methyl ester (FAME) fuel and blends with diesel fuel — Determination of oxidation stability by accelerated oxidation method*