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**Goriva za motorna vozila - Metilni estri maščobnih kislin (FAME) za dizelske motorje in ogrevanje - Zahteve in preskusne metode**

Liquid petroleum products - Fatty acid methyl esters (FAME) for use in diesel engines and heating applications - Requirements and test methods

Flüssige Mineralölerzeugnisse - Fettsäure-Methylester (FAME) zur Verwendung in Dieselmotoren und als Heizöl - Anforderungen und Prüfverfahren

Produits pétroliers liquides - Esters méthyliques d'acides gras (EMAG) pour moteurs diesel et comme combustible de chauffage - Exigences et méthodes d'essai

**Ta slovenski standard je istoveten z: EN 14214:2012+A1:2014/prA2**

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**ICS:**

75.160.20      Tekoča goriva      Liquid fuels

**SIST EN  
14214:2012+A1:2014/oprA2:2018**

**en**



EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**DRAFT**  
**EN 14214:2012+A1:2014**  
**prA2**

February 2018

ICS 75.160.40

English Version

**Liquid petroleum products - Fatty acid methyl esters  
(FAME) for use in diesel engines and heating applications -  
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Produits pétroliers liquides - Esters méthyliques  
d'acides gras (EMAG) pour moteurs diesel et comme  
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Flüssige Mineralölerzeugnisse - Fettsäure-Methylester  
(FAME) zur Verwendung in Dieselmotoren und als  
Heizöl - Anforderungen und Prüfverfahren

This draft amendment is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 19.

This draft amendment A2, if approved, will modify the European Standard EN 14214:2012+A1:2014. If this draft becomes an amendment, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for inclusion of this amendment into the relevant national standard without any alteration.

This draft amendment was established by CEN 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-CENELEC Management Centre has the same status as the official versions.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

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## European foreword

This document (EN 14214:2012+A1:2014/prA2:2018) 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 document is currently submitted to the CEN Enquiry.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association.

This second Amendment is to initiate a quick fix for the problems with applying EN 12662:2014 to B100 (referring back to a previous standard) and to introduce reference to EN 16942 (fuel labelling). Next, new and revised determination methods are introduced and with them some methods of dispute (changes) are required. That implies updates to Annex A, wherein additional corrections for earlier omissions concerning viscosity and metals content are corrected as well.

**EN 14214:2012+A1:2014/prA2:2018 (E)****1 Modifications to the Foreword**

*Replace the tenth and the eleventh listed items under technical changes with:*

"

- inclusion of new and revised test methods resulting from work under CEN/TC 19 and in cooperation with CEN/TC 307;"

*At the end of the last listed item under technical changes, replace "handling the product" with "handling the fuel".*

*After the last listed item under the technical changes, add the following list entries:*

"

- introduction of the new pump marking requirements as developed by CEN/TC 441;
- amalgamation of the B100 fuel climatic grades into one climatic table as most of the original arctic grades cannot be produced;
- reference to recently developed CEN Technical Reports on cold operability testing and on cold filterability issues."

**2 Modification to the Introduction**

*Replace the entire third paragraph with the following one:*

"Concerning total contamination, several studies have been executed and updates to the test method for biodiesel blends have been made, but work is still pending and therefore the optimal procedure and its repeatability and reproducibility for B100 have not yet been fully established."

**3 Modifications to Clause 2, Normative references**

*Replace the whole reference to EN 116:1997 with:*

"EN 116:2015, *Diesel and domestic heating fuels — Determination of cold filter plugging point — Stepwise cooling bath method*".

*Replace the whole reference to EN 12662:2013 with:*

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

*Replace the whole reference to EN 14112:2003 with:*

"EN 14112:2016, *Fat and oil derivatives — Fatty Acid Methyl Esters (FAME) — Determination of oxidation stability (accelerated oxidation test)*".

*Replace the whole reference to prEN 15751:2012 with:*

"EN 15751:2014, *Automotive fuels — Fatty acid methyl ester (FAME) fuel and blends with diesel fuel — Determination of oxidation stability by accelerated oxidation method*".

*Replace the whole reference to EN 15779:2009 with:*

"EN 15779:2009+A1:2013, *Petroleum products and fat and oil derivatives — Fatty acid methyl esters (FAME) for diesel engines — Determination of polyunsaturated ( $\geq 4$  double bonds) fatty acid methyl esters (PUFA) by gas chromatography*".

*Add the following new reference just after the reference to EN 15779:2009:*

*“EN 16144, Liquid petroleum products — Determination of ignition delay and derived cetane number (DCN) of middle distillate fuels — Fixed range injection period, constant volume combustion chamber method”.*

*Add the following new references just after the reference to EN 16329:2013:*

*“EN 16715:2015, Liquid petroleum products — Determination of ignition delay and derived cetane number (DCN) of middle distillate fuels — Ignition delay and combustion delay determination using a constant volume combustion chamber with direct fuel injection*

*EN 16896:2016, Petroleum products and related products — Determination of kinematic viscosity — Method by Stabinger type viscosimeter*

*EN 16942, Fuels — Identification of vehicle compatibility — Graphical expression for consumer information”.*

*Replace the whole reference to EN ISO 2719:2002 with:*

*“EN ISO 2719:2016, Determination of flash point — Pensky-Martens closed cup method (ISO 2719:2016)”.*

*Replace the whole reference to EN ISO 3679:2004 with:*

*“EN ISO 3679:2015, Determination of flash no-flash and flash point — Rapid equilibrium closed cup method (ISO 3679:2015)”.*

*Replace the whole reference to EN ISO 4259:2006 with the two following references:*

*“EN ISO 4259-1, Petroleum products — Precision of measurement methods and results — Part 1: Determination of precision data in relation to methods of test (ISO 4259-1)*

*EN ISO 4259-2, Petroleum and related products — Precision of measurement methods and results — Part 2: Interpretation and application of precision data in relation to methods of test (ISO 4259-2)”.*

#### **4 Modification to Clause 4, Pump marking**

*Replace the content of this clause with:*

*“Information to be marked on dispensing pumps and nozzles used for delivering FAME diesel fuel to be used as fuel in diesel engines, and the dimensions of the mark shall be in accordance with EN 16942.”.*

#### **5 Modification to 5.2.1, General**

*In the second sentence, replace “appropriate amount to help” with “appropriate amount, to help”.*

#### **6 Modifications to 5.3, Generally applicable requirements and related test methods**

*In 5.3.1, in the last sentence, replace “Annex A, where” with “Annex A, especially where”.*

*In Table 1:*

- in the 5th row (Cetane number), in the last column, after “EN ISO 5165”, add “EN 16144, EN 16896 and EN 16715 C” into the cell as the four test methods of choice;*
- in the 7th row (Oxidation stability), in the last column, replace “prEN 15751” with “EN 15751”;*

**EN 14214:2012+A1:2014/prA2:2018 (E)**

- in the 18<sup>th</sup> row (Water content), in the 2<sup>nd</sup> column, replace “mg/kg” with “% (m/m)”, and, in the 4<sup>th</sup> column, replace “500” with “0,050”;
- replace the content of footnote <sup>f</sup> with “Procedure C shall be applied.”;
- replace the content of footnote <sup>h</sup> with “The determination of derived cetane number for FAME is not included in the precision determinations of some test methods.”;
- delete Footnotes <sup>e</sup> and <sup>i</sup>, their references in the table and renumber the other ones throughout the table;
- introduce a new footnote in the 19<sup>th</sup> row (Total contamination), in the last column, with the corresponding content in the final row “EN 12662:2008 shall be used as it is applicable to pure FAME.”.

**7 Modification to 5.4.1 General**

Add the following text at the end of the 2<sup>nd</sup> sentence of the NOTE, i.e. just after “filter plugging in cold weather”: “(see also [6] and [7])”.

**8 Modifications to 5.4.2, FAME being used at 100 % as fuel for diesel engines and heating applications**

Replace the first paragraph with the following one:

“Climate-dependent requirements for FAME being used at 100 % (V/V) concentration are given in Table 2. The options are for seven CFPP (cold filter plugging point) grades. When tested by the methods given in Table 2, FAME “as fuel for diesel engines” or “as fuel for heating applications” shall be in accordance with the limits specified in this table.”.

Delete Table 2b, Arctic climates, in total and delete the sub-title of Table 2a “Temperate climates”.

Add into Table 2 (new numbering) an 8<sup>th</sup> column of limits with the heading “Grade G” and a subsequent temperature indicated as “-26”.

**9 Modifications to 5.5, Precision and dispute**

In 5.5.1, replace twice “EN ISO 4259” with “the EN ISO 4259 series”.

In 5.5.2:

- introduce the following text after the second sentence: “In cases of dispute concerning viscosity, EN ISO 3104 shall be used.

In cases of dispute concerning cetane number, EN ISO 5165 shall be used.”;

- in the 3<sup>rd</sup> paragraph, replace “prEN 15751” with “EN 15751”;
- in the 7<sup>th</sup> paragraph, replace “EN ISO 4259” with “the EN ISO 4259 series” and
- introduce the following sentence after the last sentence: “In cases of dispute concerning CFPP, EN 116 shall be used.”.

Delete the whole Entry 5.5.3, including the NOTE.



## 10 Modification to Annex A (normative), Details of interlaboratory test programme

Replace the entire text of Annex A, including Table A.1, with the following text:

“The precision data given in Table A.1 apply in the case of FAME, most are already indicated in the standard and the reproducibility at specification limit is given as information to users and traders of the product. In Table A.1 those data for requirements from standardised test methods that differ from ISO/TC 28 or CEN/TC 19 precision data are given in bold (with their respective repeatability,  $r$ ). More details are available in the interlaboratory test report [4].

**Table A.1 — Precision data from interlaboratory test programme**

Property	Unit	Test method	Precision equation ( $R$ )	Reproducibility at specification limit
FAME content	% (m/m)	EN 14103:2011	4,16	4,16
Density at 15 °C	kg/m <sup>3</sup>	EN ISO 3675:1998	1,2	1,2
		EN ISO 12185:1996	0,5	0,5
Viscosity at 40 °C	mm <sup>2</sup> /s	EN ISO 3104:1996	0,008 2 ( $X + 1$ )	0,036 9 ( $X = 3,50$ ) 0,049 2 ( $X = 5,00$ )
		EN 16896:2016	$R = 0,0346 + 0,005 X$	0,052 1 ( $X = 3,50$ ) 0,059 6 ( $X = 5,00$ )
Flash point	°C	EN ISO 3679:2015	15	15
		EN ISO 2719:2016	14,7	14,7
Cetane number		<b>EN ISO 5165:1998</b>	<b>5,0 (<math>r = 2,4</math>)</b>	5,0
		EN 16715:2015	0,046 31 ( $X - 21$ )	1,4
Oxidation stability (at 110 °C)	h	EN 15751:2014	0,190 38 $X + 0,372 69$	1,9
		EN 14112:2016	0,26 $X + 0,23$	2,3
Acid value	mg KOH/g	EN 14104:2003	0,06	0,06
Iodine value	g iodine/	EN 14111:2003	5	5
	100g	EN 16300:2012	0,053 $X + 1,121 6$	7,5