Automotive fuels - Determination of iodine value in fatty acid methyl esters (FAME) - Calculation method from gas chromatographic data

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NATIONAL FOREWORD

See Eesti standard EVS-EN 16300:2012 sisaldab Euroopa standardi EN 16300:2012 ingliskeelset teksti.	This Estonian standard EVS-EN 16300:2012 consists of the English text of the European standard EN 16300:2012.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 05.09.2012.	Date of Availability of the European standard is 05.09.2012.
Standard on kättesaadav Eesti Standardikeskusest.	The standard is available from the Estonian Centre for Standardisation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

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Automotive fuels - Determination of iodine value in fatty acid methyl esters (FAME) - Calculation method from gas chromatographic data

Carburants pour automobiles - Détermination de l'indice d'iode dans les esters méthyliques d'acides gras - Méthode de calcul à partir des données obtenues par chromatographie en phase gazeuse

Kraftstoffe für Kraftfahrzeuge - Bestimmung der Iodzahl in Fettsäure-Methylester (FAME) - Berechnung aus gaschromatographischen Daten

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Foreword

This document (EN 16300:2012) 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of an identical text or by endorsement, at the latest by March 2013, and conflicting national standards shall be withdrawn at the latest by March 2013.

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Introduction

This European Standard has been developed in CEN/TC 19/JWG 1. This document is a self-contained European test method based on the provisions given in Annex B of EN 14214:2008 [2]. Some markets need a full test method to check FAME for compliance with EN 14214.

The method is not intended as a replacement for EN 14111 [1] (see also Scope).

The method is based on results for individual FAME components as determined by EN 14103. On the basis of EN 14103 up to the C24 esters can be determined and a calculation can be done. The correlation is well within the repeatability of the existing test method.

1 Scope

This European Standard specifies a calculation procedure for the determination of Iodine value ("CIV" - "calculated iodine value"), of fatty acid methyl esters (FAME) to be used either as automotive or heating fuel for diesel engines as specified in EN 14214 [2] or as an extender for automotive fuel for diesel engines as specified in EN 590 [4].

This procedure has originally been described in Annex B of EN 14214:2008 [2]. The calculation procedure is now specified for methyl esters between C14 and C24. The calculation procedure uses as data entry the results from the gas chromatography determination (GC) according to EN 14103 of individual fatty acid methyl esters and is based on AOCS recommended practice Cd 1c – 85 for the determination of the iodine value of edible oil from its fatty acid composition. It is important to recognise that the latest version of EN 14103 is to be used for the determination of individual FAME components.

NOTE 1 Experience from the field and from several precision evaluation campaigns in Germany and elsewhere indicates that the results of the determination of iodine value by calculation specified here are very close to results obtained by titration with Wijs solvent according to EN 14111. Observed small differences were always found to be smaller than the reproducibility published in the actual EN 14111.

For informative purposes only, but not for cases of dispute, EN 14331 [5] may also be used to extract the FAME contents from FAME containing diesel fuels (like B5, B7, B30, etc.) and to use the contents of the individual FAME components from this method as data entry for the calculation specified in this European Standard.

In principle, other fatty acid *alkyl* esters can also be analysed. However, neither the close correlation to the titration method EN 14111 has been verified nor is any precision information available for such an extension of application range.

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

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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

3 Procedure

The contents of individual fatty acid methyl esters (FAME) are determined according to the GC-determination of C18:3 which is specified in EN 14103. The contents, w_i, expressed in % (*m/m*), obtained for each of the individual FAMEs (*i*) are then used to calculate the contributions to the iodine value from each FAME component as given in formula (1), using the contribution factors given in Table 1. The calculated iodine value (*CIV*) is then determined as the sum of the individual contributions, disregarding (i.e. without inclusion of) the FAME component used as internal standard in EN 14103. An example for this calculation is given Table 2.

$$CIV = \sum_i \mu_i \cdot C_i \qquad (1)$$

where

CIV is the calculated Iodine value of the sample, given in g Iodine per 100 g sample;