

Fat and oil derivatives - Fatty Acid Methyl Esters -  
Determination of methanol content

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

See Eesti standard EVS-EN 14110:2019 sisaldab Euroopa standardi EN 14110:2019 ingliskeelset teksti.	This Estonian standard EVS-EN 14110:2019 consists of the English text of the European standard EN 14110:2019.
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 10.04.2019.	Date of Availability of the European standard is 10.04.2019.
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](mailto:standardiosakond@evs.ee).

ICS 67.200.10

Standardite reprodutseerimise ja levitamise õigus kuulub Eesti Standardikeskusele

Andmete paljundamine, taastekitamine, kopeerimine, salvestamine elektroonsesse süsteemi või edastamine ükskõik millises vormis või millisel teel ilma Eesti Standardikeskuse kirjaliku loata on keelatud.

Kui Teil on küsimusi standardite autorikaitse kohta, võtke palun ühendust Eesti Standardikeskusega:

Koduleht [www.evs.ee](http://www.evs.ee); telefon 605 5050; e-post [info@evs.ee](mailto:info@evs.ee)

The right to reproduce and distribute standards belongs to the Estonian Centre for Standardisation

No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying, without a written permission from the Estonian Centre for Standardisation.

If you have any questions about copyright, please contact Estonian Centre for Standardisation:

Homepage [www.evs.ee](http://www.evs.ee); phone +372 605 5050; e-mail [info@evs.ee](mailto:info@evs.ee)

English Version

## Fat and oil derivatives - Fatty Acid Methyl Esters - Determination of methanol content

Produits dérivés des corps gras - Esters méthyliques  
d'acides gras - Détermination de la teneur en méthanol

Erzeugnisse aus pflanzlichen und tierischen Fetten und  
Ölen - Fettsäure-Methylester (FAME) - Bestimmung  
des Methanolgehaltes

This European Standard was approved by CEN on 13 December 2019.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists 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.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

# Contents

Page

European foreword.....	3
1 Scope.....	4
2 Normative references.....	4
3 Terms and definitions .....	4
4 Principle .....	4
5 Reagents .....	4
6 Apparatus.....	5
7 Sampling.....	6
8 Operation conditions.....	6
8.1 Analytical conditions .....	6
8.2 Operation .....	7
9 Calibration solutions.....	7
10 Procedure.....	7
10.1 General.....	7
10.2 Procedure A — Internal calibration.....	7
10.2.1 General.....	7
10.2.2 Internal calibration .....	8
10.2.3 Analysis and Calculation using internal calibration.....	8
10.3 Procedure B — External calibration .....	9
10.3.1 General.....	9
10.3.2 External calibration .....	9
10.3.3 Analysis and calculation using external calibration .....	9
11 Precision.....	9
11.1 General.....	9
11.2 Repeatability.....	9
11.3 Reproducibility.....	10
12 Test report.....	10
Annex A (informative) Results on an interlaboratory study.....	11
Annex B (informative) Example of a chromatogram for procedure A.....	12
Bibliography.....	13

## European foreword

This document (EN 14110:2019) has been prepared by Technical Committee CEN/TC 307 “Oilseeds, vegetable and animal fats and oils and their by-products - Methods of sampling and analysis”, the secretariat of which is held by AFNOR.

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 October 2019, and conflicting national standards shall be withdrawn at the latest by October 2019.

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 14110:2003.

This document has been prepared under mandate M/245 on Fatty Acid Methyl Ester (FAME) given to CEN by the European Commission and the European Free Trade Association.

Significant changes between this document and EN 14110:2003 are:

- Addition of Formula (1) — resolution between methanol and 2-propanol
- Correction of the Formula to calculate the methanol content based on external calibration
- Addition of Clause 2 — Normative References
- Addition of Clause 7 — Sampling

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, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

## 1 Scope

This document specifies a method for the determination of the methanol content of fatty acid methyl esters (FAME) for use as diesel fuel and domestic heating fuel. The method is applicable to methanol contents between 0,01 % (*m/m*) and 0,5 % (*m/m*). The method is not applicable to mixtures of FAME containing other low boiling components.

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

**WARNING** — The use of this document can 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 users of this document to take appropriate measures to ensure the safety and health of personnel prior to application of the standard, and fulfil statutory and regulatory requirements for this purpose.

## 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 3171, *Petroleum liquids — Automatic pipeline sampling (ISO 3171)*

## 3 Terms and definitions

No terms and definitions are listed in this document.

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

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

## 4 Principle

The sample is heated at 80 °C in a hermetically sealed vial to allow desorption of contained methanol into the gas phase. When the equilibrium is reached a defined part of the gas phase is injected into a gas chromatograph, where methanol is detected with a flame ionization detector.

The amount of methanol can be determined either by internal calibration (procedure A) or by external calibration (procedure B).

If only manual equipment is available then only internal standard calibration should be used.

## 5 Reagents

Use only reagents of recognized analytical grade, unless otherwise specified.

**5.1 Methanol**, of known purity greater than 99,5 %.

**5.2 2-propanol**, of known purity, greater than 99,5 % (for procedure A, internal calibration).