

Animal and vegetable fats and oils - Gas chromatography of fatty acid methyl esters - Part 1: Guidelines on modern gas chromatography of fatty acid methyl esters (ISO 12966-1:2014)

## EESTI STANDARDI EESSÕNA

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ICS 67.200.10

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English Version

## Animal and vegetable fats and oils - Gas chromatography of fatty acid methyl esters - Part 1: Guidelines on modern gas chromatography of fatty acid methyl esters (ISO 12966-1:2014)

Corps gras d'origines animale et végétale -  
Chromatographie en phase gazeuse des esters  
méthyliques d'acides gras - Partie 1: Lignes directrices  
relatives à la chromatographie en phase gazeuse moderne  
des esters méthyliques d'acides gras (ISO 12966-1:2014)

Tierische und pflanzliche Fette und Öle -  
Gaschromatographie von Fettsäuremethylestern - Teil 1:  
Leitfaden für die moderne Gaschromatographie von  
Fettsäuremethylestern (ISO 12966-1:2014)

This European Standard was approved by CEN on 20 October 2014.

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**CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels**

## Foreword

This document (EN ISO 12966-1:2014) has been prepared by Technical Committee ISO/TC 34 "Food products" in collaboration 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of an identical text or by endorsement, at the latest by June 2015, and conflicting national standards shall be withdrawn at the latest by June 2015.

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### Endorsement notice

The text of ISO 12966-1:2014 has been approved by CEN as EN ISO 12966-1:2014 without any modification.

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## Introduction

This part of ISO 12966 is one of a suite of four International Standards for the preparation and determination of fatty acid methyl esters by gas chromatography in animal and vegetable fats and oils. ISO 12966 (all parts) is applicable to crude, refined, partially hydrogenated or fully hydrogenated fats, oils and fatty acids derived from animal and vegetable sources.

ISO 12966 (all parts) is not suitable for the analysis of dairy, ruminant fats and oils (including milk and milk products or fat coming from milk and milk products), or products supplemented with conjugated linoleic acid (CLA). Furthermore it is not intended to be applied to polymerized and oxidized fats and oils.

This part of ISO 12966 is a guideline to the modern gas chromatography of fatty acid methyl esters, while ISO 12966-2 and ISO 12966-3 cover the preparation of fatty acid methyl esters by different methods. In ISO 12966-4, the conditions for the analysis of fatty acid methyl esters by capillary gas chromatography are given.

This suite of International Standards replaces the following International Standards:

- ISO 5508:1990 is replaced by ISO 12966-1 and ISO 12966-4
- ISO 15304:2002 is replaced by ISO 12966-1 and ISO 12966-4
- ISO 5509:2000 is replaced by ISO 12966-2 and ISO 12966-3

# Animal and vegetable fats and oils — Gas chromatography of fatty acid methyl esters —

## Part 1: Guidelines on modern gas chromatography of fatty acid methyl esters

### 1 Scope

This part of ISO 12966 gives an overview of the gas chromatographic determination of fatty acids, free and bound, in animal and vegetable fats and oils following their conversion to fatty acid methyl esters (FAMES).

The qualitative and quantitative determination of the composition of fatty acids by gas liquid chromatography (GLC) is a widely used application in lipid analysis. It is used for the characterization of fats and oils, or fatty foodstuffs after the extraction of the oil from the matrix. The bound fatty acids of the triacylglycerols (TAGs) and, depending on the esterification method, the free fatty acids (FFA) and other lipids, are converted to fatty acid methyl esters (FAMES), which are determined by capillary gas chromatography. Depending on the number of different fatty acids (theoretically more than 50 different fatty acids can be present) capillary columns with a length of 10 m to 100 m are used for a separation.

The GLC of FAMES is applicable to all natural and synthetic mixtures of tri-, di- and monoacylglycerols, to fatty acid esters, free fatty acids, soaps and other fatty compounds. With this suite of standards, FAMES from C4 to C26 can be determined, including saturated fatty acid methyl esters, *cis*- and *trans*-monounsaturated fatty acid methyl esters, and *cis*- and *trans*-polyunsaturated fatty acid methyl esters.

For the determination of short chain fatty acids, isopropyl and butyl esters are often used so as to avoid interferences with the solvent peak and in order to reduce differences in detector responses.

### 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.

ISO 12966-2, *Animal and vegetable fats and oils — Gas chromatography of fatty acid methyl esters — Part 2: Preparation of methyl esters of fatty acids*

ISO 12966-3, *Animal and vegetable fats and oils — Gas chromatography of fatty acid methyl esters — Part 3: Preparation of methyl esters using trimethylsulfonium hydroxide (TMSH)*

ISO 12966-4:—<sup>1)</sup>, *Animal and vegetable fats and oils — Determination of methyl esters of fatty acids — Part 4: Capillary gas chromatographic method*

### 3 Principle

Gas liquid chromatography (GLC) is used for the qualitative and quantitative analysis of FAMES. The FAMES are prepared in accordance with ISO 12966-2 or ISO 12966-3 and the dissolved FAMES are then injected into and vaporized within the injector. The separation of FAMES is achieved on analytical

1) Under preparation. To be published.