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I.S. EN ISO 17059:2009

# Oilseeds - Extraction of oil and preparation of methyl esters of triglyceride fatty acids for analysis by gas chromatography (Rapid method) (ISO 17059:2007)

## I.S. EN ISO 17059:2009

*Incorporating amendments/corrigenda issued since publication:*

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English Version

**Oilseeds - Extraction of oil and preparation of methyl esters of triglyceride fatty acids for analysis by gas chromatography (Rapid method) (ISO 17059:2007)**

Graines oléagineuses - Extraction de l'huile et préparation des esters méthyliques d'acides gras de triglycérides pour analyse par chromatographie en phase gazeuse (Méthode rapide) (ISO 17059:2007)

Ölsamen - Extraktion von Öl und Herstellung von Methylester aus den Fettsäuren der Triglyceride für die Analyse durch Gaschromatographie (Schnellverfahren) (ISO 17059:2007)

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## **Contents**

Page

<b>Foreword.....</b>	<b>3</b>
----------------------	----------

## **Foreword**

The text of ISO 17059:2007 has been prepared by Technical Committee ISO/TC 34 “Food products” of the International Organization for Standardization (ISO) and has been taken over as EN ISO 17059:2009 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of an identical text or by endorsement, at the latest by February 2010, and conflicting national standards shall be withdrawn at the latest by February 2010.

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### **Endorsement notice**

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STANDARD**

**ISO  
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**Oilseeds — Extraction of oil and  
preparation of methyl esters of  
triglyceride fatty acids for analysis by gas  
chromatography (Rapid method)**

*Graines oléagineuses — Extraction de l'huile et préparation des esters  
méthyliques d'acides gras de triglycérides pour analyse par  
chromatographie en phase gazeuse (Méthode rapide)*



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## **Foreword**

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International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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ISO 17059 was prepared by Technical Committee ISO/TC 34, *Food products*, Subcommittee SC 2, *Oleaginous seeds and fruits and oilseed meals*.

## **Introduction**

Chromatographic analysis of the fatty acid methyl esters (FAME) of oilseeds requires oil extraction from the oilseeds. To date, no International Standard has specified a method for extracting oil from oilseeds for FAME analysis. The methods usually performed in laboratories involve oil extraction for the determination of oil content and are tedious or time consuming<sup>[2], [3]</sup>. Consequently, the total duration and cost of the analysis of triglyceride fatty acids in oilseeds, including oil extraction, preparation and gas chromatography of the FAME are considerably increased by the oil extraction step.

This International Standard specifies a rapid and optimized method for a combined oil extraction and FAME preparation. The oil is only partially extracted from the seeds and the extracted fraction remains representative enough of the total content when the method is applied to the seeds specified in the Scope<sup>[4], [5]</sup>. The FAME are prepared according to the transesterification method described in ISO 5509 and slightly modified to be applied to iso-octane solutions of oil.

Taking into account that no reference method for oil extraction exists, the oil extraction method specified in this International Standard was compared to ISO 659<sup>[2]</sup> in an interlaboratory test<sup>[6]</sup>. Results showed very good agreement between the two methods except when applied to rapeseed with high erucic acid content. In this case, this method led to values of erucic acid content higher by approximately a mass fraction of 1 %.

# Oilseeds — Extraction of oil and preparation of methyl esters of triglyceride fatty acids for analysis by gas chromatography (Rapid method)

## 1 Scope

This International Standard specifies a rapid method for extraction of oil and for preparation of the methyl esters of fatty acids. The methyl esters thus obtained can be used for gas chromatography.

This International Standard is applicable to the following oilseeds: rape, sunflower, soya beans, mustard, linseed.

**NOTE** Applying this rapid method to high erucic acid content rapeseed leads to an overestimation of erucic acid content by approximately a mass fraction of 1 %.

## 2 Normative references

The following referenced documents are indispensable for the application of this International Standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 664, *Oilseeds — Reduction of laboratory sample to test sample*

ISO 5509:2000, *Animal and vegetable fats and oils — Preparation of methyl esters of fatty acids*

## 3 Principle

The oil is cold extracted from previously crushed grains by shaking in iso-octane. After filtration, the triglyceride fatty acids present in the iso-octane solution are transesterified with potassium hydroxide into methyl esters.

## 4 Reagents

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

**4.1 Iso-octane** (2,2,4-trimethylpentane) of chromatographic quality. See Annex A.

**4.2 Anhydrous sodium sulfate.**

**4.3 Other reagents** used for the preparation of the methyl esters are specified in ISO 5509:2000, 5.3.1 and 5.3.3.

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