

**Õliseemned. Õlisisalduse määramine. Kustumatu laine  
madallahendustuumamagnetresonantsspektromeetriat  
kasutav meetod (kiirmeetod)**

Oilseeds - Determination of oil content - Method using  
continuous-wave low-resolution nuclear magnetic  
resonance spectrometry (Rapid method)

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN ISO 5511:2000 sisaldab Euroopa standardi EN ISO 5511:1996+AC:1997 ingliskeelset teksti.

Standard on kinnitatud Eesti Standardikeskuse 11.01.2000 käskkirjaga ja jõustub sellekohase teate avaldamisel EVS Teatajas.

Standard on kättesaadav Eesti standardiorganisatsioonist.

This Estonian standard EVS-EN ISO 5511:2000 consists of the English text of the European standard EN ISO 5511:1996+AC:1997.

This standard is ratified with the order of Estonian Centre for Standardisation dated 11.01.2000 and is endorsed with the notification published in the official bulletin of the Estonian national standardisation organisation.

The standard is available from Estonian standardisation organisation.

ICS 67.200.20

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ICS 67.200.20

Descriptors: agricultural products, oilseeds, chemical analysis, determination of content, oils, nuclear magnetic resonance method, spectrometric method

English version

**Oilseeds - Determination of oil content - Method  
using continuous-wave low-resolution nuclear  
magnetic resonance spectrometry (Rapid method)  
(ISO 5511:1992)**

Graines oléagineuses - Détermination de la  
teneur en huile - Méthode par spectrométrie de  
résonance magnétique nucléaire à basse  
résolution et à onde continue (Méthode rapide)  
(ISO 5511:1992)

Ölsamen - Bestimmung des Ölgehaltes -  
Kernresonanzspektroskopie mit niedriger  
Auflösung (Schnellverfahren) (ISO 5511:1992)

This European Standard was approved by CEN on 1995-12-06. 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.

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**CEN**

European Committee for Standardization  
Comité Européen de Normalisation  
Europäisches Komitee für Normung

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

## Foreword

The text of the International Standard from Technical Committee ISO/TC 34 "Agricultural food products" of the International Organization for Standardization (ISO) has been taken over as an European Standard 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 month of March 1997, and conflicting national standards shall be withdrawn at the latest by March 1997.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

## Endorsement notice

The text of the International Standard ISO 5511:1992 has been approved by CEN as a European Standard without any modification.

NOTE: Normative references to International Standards are listed in annex ZA (normative).

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**Annex ZA (normative)**

**Normative references to international publications  
with their relevant European publications**

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN</u>	<u>Year</u>
ISO 664	1990	Oilseeds - Reduction of laboratory sample to test sample	EN ISO 664	1995
ISO 665	1977	Oilseeds - Determination of moisture and volatile matter content	EN ISO 665	1995

# EUROPEAN STANDARD EN ISO 5511:1996 AC:1997

## NORME EUROPEENNE

## EUROPÄISCHE NORM

April 1997

avril 1997

April 1997

English version  
Version française  
Deutsche Fassung

Amends EN ISO 5511, September 1996

Amende EN ISO 5511, septembre 1996

Änderung zur EN ISO 5511, September 1996

Oilseeds - Determination of oil content - Method  
using continuous-wave low-resolution nuclear  
magnetic resonance spectrometry (Rapid method)

Graines oléagineuses -  
Détermination de la teneur en huile  
- Méthode par spectrométrie de  
résonance magnétique nucléaire à  
basse résolution et à onde continue  
(Méthode rapide)

Ölsamen - Bestimmung des  
Ölgehaltes -  
Kernresonanzspektroskopie mit  
niedriger Auflösung  
(Schnellverfahren)

This corrigendum becomes effective on 1997-04-04 for incorporation in the three official language versions of the EN.

Ce corrigendum prendra effet le 1997-04-04 pour introduction dans les trois versions officielles de la EN.

Die Berichtigung tritt am 1997-04-04 in Kraft und ist in die drei offiziellen Fassungen der EN einzufügen.

**CEN**

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Comité Européen de Normalisation  
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Ref. no. EN ISO 5511:1996/AC:1997 E/F/D

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**Subclause 10.3**

Replace the formula with the following:

$$w = \frac{w_a - w_r \times \left(1 - \frac{w_H}{100 \%}\right)}{1 - \frac{w_r}{100 \%}}$$

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**Subclause 10.3**

Remplace la formule avec la suivante:

$$w = \frac{w_a - w_r \times \left(1 - \frac{w_H}{100 \%}\right)}{1 - \frac{w_r}{100 \%}}$$

Seite 4

**Unterschnitt 10.3**

Ersetze die Gleichung mit Folgendem:

$$w = \frac{w_a - w_r \times \left(1 - \frac{w_H}{100 \%}\right)}{1 - \frac{w_r}{100 \%}}$$

# INTERNATIONAL STANDARD

**ISO**  
**5511**

Second edition  
1992-07-01

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## **Oilseeds — Determination of oil content — Method using continuous-wave low-resolution nuclear magnetic resonance spectrometry (Rapid method)**

*Graines oléagineuses — Détermination de la teneur en huile — Méthode  
par spectrométrie de résonance magnétique nucléaire à basse résolution  
et à onde continue (Méthode rapide)*

INTERNATIONAL

ISO



Reference number  
ISO 5511:1992(E)



## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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.

International Standard ISO 5511 was prepared by Technical Committee ISO/TC 34, *Agricultural food products*, Sub-Committee SC 2, *Oleaginous seeds and fruits*.

This second edition cancels and replaces the first edition (ISO 5511:1984), of which it constitutes a technical revision.

Annex A of this International Standard is for information only.

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International Organization for Standardization  
Case Postale 56 • CH-1211 Genève 20 • Switzerland

Printed in Switzerland

# Oilseeds — Determination of oil content — Method using continuous-wave low-resolution nuclear magnetic resonance spectrometry (Rapid method)

## 1 Scope

This International Standard specifies a rapid method for the determination of the oil content of oilseeds using continuous-wave low-resolution nuclear magnetic resonance spectrometry.

Under normal conditions of use, it does not apply to oilseeds which do not yield oil which is completely liquid at 20 °C (e.g. shea, palm, illipe, cocoa, etc.).

This method has been successfully tested on the following oilseeds: rapeseed, soya, sunflower seed and groundnuts.

NOTE 1 The reference method for the determination of the oil content of oilseeds is specified in ISO 659.

## 2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 659:1988, *Oilseeds — Determination of hexane extract (or light petroleum extract), called "oil content"*.

ISO 664:1990, *Oilseeds — Reduction of laboratory sample to test sample*.

ISO 665:1977, *Oilseeds — Determination of moisture and volatile matter content*.

ISO 771:1977, *Oilseed residues — Determination of moisture and volatile matter content*.

## 3 Definitions

For the purposes of this International Standard, the following definitions apply.

**3.1 oil content:** The mass fraction of organic substances, which are liquid at the temperature of measurement (in principle 20 °C) of the oilseeds, determined using the method specified in this International Standard.

The oil content is expressed as a percentage by mass.

**3.2 single test result:** Result obtained by carrying out a specified test method one time according to the prescribed procedure.

**3.3 repeatability conditions:** Conditions where mutually independent test results are obtained with the same method on identical test material in the same laboratory by the same operator using the same equipment within short intervals of time. [ISO 5725:1986, 3.1.7]

## 4 Principle

Determination using continuous-wave low-resolution nuclear magnetic resonance (NMR) spectrometry of the content of liquid components containing hydrogen which are present in oilseeds which have been previously dried at  $103\text{ °C} \pm 2\text{ °C}$ , and taking into account the effect of solids (oilseed residue).

## 5 Materials

**5.1 Calibration oil,** crude oil from seeds of the same botanical species and of similar geographical origin and chemical composition to those of the seeds for analysis, extracted in the laboratory carrying out the analysis, in accordance with the