# SLOVENSKI STANDARD
# oSIST prEN ISO 665:2020

**01-januar-2020**

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**Oljnice - Določevanje vlage in hlapnih snovi (ISO/FDIS 665:2019)**

Oilseeds - Determination of moisture and volatile matter content (ISO/FDIS 665:2019)

Ölsaaten - Bestimmung des Feuchtegehaltes und des Gehaltes an flüchtigen Bestandteilen (ISO/FDIS 665:2019)

Graines oléagineuses - Détermination de la teneur en eau et en matières volatiles (ISO/FDIS 665:2019)



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# Oilseeds — Determination of moisture and volatile matter content

*Graines oléagineuses — Détermination de la teneur en eau et en matières volatiles*



**ISO/CEN PARALLEL PROCESSING**



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# Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html.



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



This third edition cancels and replaces the second edition (ISO 665:2000), of which it constitutes a minor revision. The changes compared with the previous edition are as follows:

— the date of the normative reference ISO 664 has been deleted;

— ISO 542 has been cancelled and replaced by ISO 21294 and thus the reference in this document has been updated accordingly.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

 

# Oilseeds — Determination of moisture and volatile matter content

## 1 Scope

This document specifies a method for the determination of the moisture and volatile matter content of oilseeds.

## 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.

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

## 3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.



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

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/



**3.1**
**moisture and volatile matter content**
loss in mass measured under the operating conditions specified in this document

Note 1 to entry: It is expressed as a mass fraction, in per cent [formerly given as % (mass fraction)] of the mass of the initial sample.

## 4 Principle

The moisture and volatile matter content of a test portion is determined, either on the material as received (pure seed and impurities) or, if required, on the pure seed alone, by drying at 103 °C ± 2 °C in an oven at atmospheric pressure, until practically constant mass is reached.

## 5 Apparatus

Usual laboratory apparatus and, in particular, the following.

**5.1 Analytical balance**, capable of weighing to the nearest 0,001 g.

**5.2 Mechanical mill**, easy to clean, suitable for the kind of seed and allowing the latter to be ground without heating and without appreciable change in moisture, volatile matter and oil content.

**5.3 Mechanical grater** or, if not available, a hand-operated grater.

**5.4 Flat-bottomed vessel**, either of metal or glass, at the discretion of the analyst.

If metal is used, it shall be resistant to attack under the test conditions. The vessel shall be provided with a well-fitting lid and shall allow the test portion to be spread to about 0,2 g/cm$^2$ (e.g. a vessel of diameter 70 mm and height 30 mm to 40 mm). Glass vessels with ground closures may also be used.

**5.5 Electric oven**, with thermostatic control and good natural ventilation, capable of being regulated so that the temperature of the air and of the shelves in the neighbourhood of the test portions lies between 101 °C and 105 °C in normal operation.

**5.6 Desiccator**, containing an efficient desiccant such as phosphorus(V) oxide, silica gel, activated alumina, etc., and provided with a ceramic plate that allows vessels (5.4) to cool rapidly.

## 6 Sampling

Sampling is not part of the method specified in this document. A recommended sampling method is given in ISO 21294[1].

It is important that the laboratory receive a sample that is truly representative and has not been damaged or changed during transport and storage.

## 7 Preparation of test sample



**7.1** Prepare the test sample by reducing the laboratory sample in accordance with ISO 664. If large non-oleaginous foreign bodies have been separated before the reduction of the laboratory sample, make allowance for this in the calculation (see 9.2). According to the requirements of the contract, take a sample as received or after separation of the impurities.

**7.2** In the case of copra, grate the product by hand or, preferably, use a mechanical grater (5.3) that allows the whole sample to be treated. When grating by hand, which does not allow all the analysis sample to be grated, endeavour to obtain a test sample that is as representative as possible and, to this end, take account of the size and colour of different fragments.

The length of the particles after grating may exceed 2 mm but shall not be greater than 5 mm. Mix the particles carefully and carry out the determination without delay.

**7.3** In the case of seeds of medium size (groundnut, etc.), except for safflower seed, sunflower seed, soya beans and cottonseed with adherent linters, grind the test sample in the mechanical mill (5.2), which has previously been well cleaned, until the major dimension of the particles obtained is not greater than 2 mm. Reject the first particles (about one-twentieth of the sample). Collect the rest, mix carefully and carry out the determination without delay.

**7.4** Small seeds (linseed, colza, hemp, etc.), as well as safflower seed, sunflower seed, soya beans and cottonseed with adherent linters, are analysed without previous grinding.

## 8 Procedure

### 8.1 Test portion

**8.1.1** Dry the vessel with its lid for 1 h at 103 °C prior to being placed in the desiccator before weighing. Weigh the vessel (see 5.4) with its lid to the nearest 0,001 g, after leaving it open for at least 30 min in the desiccator (see 5.6) at laboratory temperature.

 

**8.1.2** Then weigh into the vessel, to the nearest 0,001 g, either:

— 5 g ± 0,5 g of the grated product (see 7.2) in the case of copra, meal (see 7.3) or medium-sized seeds other than safflower seed, sunflower seed, soya beans or cottonseed with adherent linters; or

— 5 g to 10 g of whole seed in the case of safflower seed, sunflower seed, soya beans, cottonseed with adherent linters and small seeds.

Spread the material evenly over the whole base of the vessel and close the vessel with its lid. Weigh the whole to the nearest 0,001 g.

**8.1.3** Carry out these operations as quickly as possible, to avoid any appreciable change in moisture content.

## 8.2 Determination

Place the vessel containing the test portion, with the lid removed, in the oven (see 5.5) set at 103 °C ± 2 °C. Close the oven. After 3 h (12 h to 16 h in the case of cottonseed with adherent linters), reckoned from the time when the temperature returns to 103 °C, open the oven. Immediately close the vessel with its lid and place it in the desiccator. As soon as the vessel has cooled to laboratory temperature, weigh it to the nearest 0,001 g.

Return the vessel, with the lid removed, to the oven. After 1 h, repeat the operations of closing the vessel, allowing it to cool and weighing it.

If the difference between the two weighings is equal to or less than 0,005 g (for a 5 g test portion), regard the determination as finished. If not, subject the test portion to successive 1 h periods in the oven, until the difference between two successive weighings is equal to or less than 0,005 g.

Never put moist products in the oven together with products that are nearly dry, as this will result in the latter being partially rehydrated.

Carry out two determinations on the same test sample.



# 9 Expression of results

**9.1** The moisture and volatile matter content, $w$, as a percentage by mass of the sample as received, is equal to Formula (1):

$$w = \frac{m_1 - m_2}{m_1 - m_0} \times 100 \qquad (1)$$

where

$m_0$ is the mass, in grams, of the vessel;

$m_1$ is the mass, in grams, of the vessel and test portion before drying;

$m_2$ is the mass, in grams, of the vessel and test portion after drying.

Take as the result the arithmetic mean of the results of the two determinations (see 8.2) if the difference between the results is smaller than 0,2 % (mass fraction). Otherwise, repeat the determination on two other test portions. If this time the difference again exceeds 0,2 g per 100 g of sample, take as the result the arithmetic mean of the four determinations carried out, provided that the maximum difference between the individual results does not exceed 0,5 g per 100 g of sample.

Report the result to one decimal place.

**9.2** If, before the analysis, large non-oleaginous foreign bodies have been separated from the sample (see 7.1), multiply the result obtained in accordance with 9.1 as shown by Formula (2):

$$\frac{100 - X}{100} \tag{2}$$

where $X$ is the percentage by mass of large impurities, previously separated, in the initial material as received.

**9.3** If the determination of moisture and volatile matter has been carried out on pure seed, calculate the moisture and volatile matter content by means of Formula (1).

## 10 Precision

### 10.1 Interlaboratory tests

Details of interlaboratory tests on the precision of the method are given in Annex A. The values derived from these interlaboratory tests may not be applicable to concentration ranges and matrices other than those given.

### 10.2 Repeatability

The absolute difference between two independent single test results, obtained using the same method on identical test material in the same laboratory by the same operator using the same equipment within a short interval of time, will in not more than 5 % of cases be greater than the following (absolute values):



— for rapeseed 0,2 %;

— for soya beans 0,4 %;

— for sunflower seeds 0,2 %.

### 10.3 Reproducibility

The absolute difference between two single test results, obtained using the same method on identical test material in different laboratories by different operators using different equipment, will in not more than 5 % of cases be greater than the following (absolute values):

— for rapeseed 0,4 %;

— for soya beans 2,0 %;

— for sunflower seeds 0,4 %.

## 11 Test report

The test report shall specify:

— all information necessary for the complete identification of the sample;

— the sampling method used, if known;

— the test method used, with reference to this document, i.e. ISO 665;

— all operating conditions not specified in this document, or regarded as optional, together with details of any incidents that could have influenced the result;

 