INTERNATIONAL STANDARD 771

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Oilseed residues — Determination of moisture and volatile matter content

Tourteaux de graines oléagineuses — Détermination de la teneur en eau et matières volatiles

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FOREWORD

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Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 771 was developed by Technical Committee ISO/TC 34, *Agricultural food products.*

It was submitted directly to the ISO Council, in accordance with clause 6.12.1 of the Directives for the technical work of ISO. It cancels and replaces ISO Recommendation R 771-1968, which had been approved by the member bodies of the following countries :

Australia	Germany	Poland
Brazil	Hungary	Romania
Bulgaria	India	South Africa, Rep. of
Chile	Iran	Thailand
Colombia	Israel	Turkey
Czechoslovakia	Italy	United Kingdom
Egypt, Arab Rep. of	Korea, Rep. of	U.S.S.R.
France	Netherlands	Yugoslavia

No member body had expressed disapproval of the document.

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Oilseed residues — Determination of moisture and volatile matter content

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies a method for the determination of the moisture and volatile matter content of residues (excluding compounded products) obtained by the extraction of oil from oilseeds by pressure or solvent.

2 REFERENCE

ISO 5500, *Oilseed residues — Sampling.*[1)]

3 DEFINITION

moisture and volatile matter content : The loss in mass measured under the operating conditions specified below.

The moisture and volatile matter content is expressed as a percentage by mass.

4 PRINCIPLE

Drying of a test portion at 103 ± 2 °C in an oven at atmospheric pressure, until practically constant mass is reached.

5 APPARATUS

5.1 Analytical balance.

5.2 Mechanical mill, easy to clean and allowing the residues to be ground, without heating and without appreciable change in the moisture, volatile matter and oil content, to particles passing completely through the sieve (5.3).

5.3 Sieve, with apertures of diameter 1 mm.

5.4 Flat-bottomed vessel, of metal resistant to attack under the test conditions, provided with a well fitting lid and allowing the test portion to be spread to about 0,2 g/cm^2 (for example diameter of vessel 50 to 70 mm, height about 30 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 and 105 °C in normal operation.

5.6 Desiccator, containing an efficient desiccant and provided with a metal plate which allows vessels (5.4) to cool rapidly.

6 PROCEDURE

Make all weighings to the nearest 0,001 g.

6.1 Preparation of the test sample

6.1.1 Take the contract sample obtained in accordance with ISO 5500.

6.1.2 Grind the contract sample, if necessary, in the previously well cleaned mechanical mill (5.2). First, use about one-twentieth of the sample to complete the cleaning of the mill, and reject these grindings; then grind the rest, collect the grindings, mix carefully and carry out the analysis without delay.

6.2 Test portion

6.2.1 Weigh the vessel (5.4) with its lid, after leaving it open for at least 30 min in the desiccator (5.6) at laboratory temperature.

6.2.2 Weigh into the vessel about 5 g of the test sample (6.1.2), spread this uniformly over the whole base of the vessel, close the vessel with its lid and re-weigh.

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

1) In preparation.

6.3 Determination

Place the vessel containing the test portion in the oven (5.5), which has previously been set to operate at 103 ± 2 °C, and take off the lid (see 8.1). After 2 h, reckoned from the time when the temperature returns to 103 ± 2 °C, and take off the lid (see 8.1). Close the oven. After 2 h, reckoned from the time when the temperature returns to 103 °C, open the oven, replace the lid on the vessel before removal from the oven and transfer to the desiccator. As soon as the vessel has cooled to laboratory temperature, weigh it.

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

If the difference between the two weighings is equal to or less than 0,005 g, 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 (see 8.2 and 8.3).

Carry out two determinations on the same test sample.

7 EXPRESSION OF RESULTS

7.1 Method of calculation and formula

The moisture and volatile matter content, U as a percentage by mass of the sample, is given by the formula

$$U = \frac{m_1 - m_2}{m_1 - m_0} \times 100$$

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 two determinations, provided that the requirement concerning repeatability (see 7.2) is satisfied. 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.

Express the result to one decimal place.

7.2 Repeatability

The difference between the results of two determinations carried out simultaneously or in rapid succesion by the same analyst should not exceed 0,2 g of moisture and volatile matter per 100 g of sample.

8 NOTES ON PROCEDURE

8.1 If several vessels are in the oven together, arrange them in such a way that air can circulate freely between them.

8.2 During the drying, do not add other test portions.

8.3 For most oilseed residues, a single 4 h period in the oven at 103 ± 2 °C gives equivalent results, but it is the responsibility of the analyst to confirm this in each particular case.

9 TEST REPORT

The test report shall show the method used and the result obtained. It shall also mention any operating conditions not specified in this International Standard, or regarded as optional, as well as any circumstances that may have influenced the result.

The report shall include all details required for complete identification of the sample.