TC 34

International Standard 658

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Oilseeds — Determination of impurities content

Graines oléagineuses — Détermination de la teneur en impuretés

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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 658 was developed by Technical Committee ISO/TC 34, *Agricultural food products*.

It was submitted directly to the ISO Council, in accordance with clause 5.10.1 of part 1 of the Directives for the technical work of ISO. It cancels and replaces ISO Recommendation R 658-1968, which had been approved by the member bodies of the following countries :

Australia	France	New Zealand
Belgium	Germany, F.R.	Norway
Bulgaria	Hungary	Poland
Canada	India	Romania
Chile	Iran	South Africa, Rep. of
Colombia	Ireland	Turkey
Czechoslovakia	Israel	United Kingdom
Egypt, Arab Rep. of	Italy	USSR
Finland	Netherlands	Yugoslavia

No member body had expressed disapproval of the document.

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Oilseeds — Determination of impurities content

1 Scope and field of application

This International Standard specifies a method for the determination of the impurities content of oilseeds used as primary industrial materials. It also defines the various categories of impurities as usually understood.

2 References

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

ISO 664, *Oilseeds — Reduction of contract samples to analysis samples.*

3 Definitions

3.1 impurities : All foreign matter, organic and inorganic, other than seeds of the species under consideration.

3.2 fines : The particles passing through the sieves for which the aperture sizes are given in table 1 (see 6.2.1), according to the species being analysed.

In the case of groundnut, meal from the seeds contained in the fines is not regarded as an impurity.

3.3 non-oleaginous impurities : Non-oleaginous foreign bodies (for example bits of wood, pieces of metal, stones, seeds of non-oleaginous plants), fragments of stalks, leaves and all other non-oleaginous parts belonging to the oleaginous seed analysed (for example bits of shell loose or adhering to palm kernels), retained by the sieves of the aperture sizes given in table 1. In the case of seeds sold in their shells, for example sunflower seeds (*Helianthus annuus* Linnaeus) or pumpkin seeds (*Curcurbita pepo* Linnaeus), the loose shells are regarded as impurities only if their proportion is larger than that of the corresponding kernels present in the same sample.

3.4 oleaginous impurities : Oilseeds other than those of the species under consideration.

4 Principle

Separation of the impurities, by sieving and sorting, into three categories :

— fines;

— non-oleaginous impurities;

— oleaginous impurities.

Determination of the mass of each category.

5 Apparatus

5.1 Sieves, having circular apertures of the diameter given in table 1.

5.2 Tweezers, or other suitable instruments.

5.3 Analytical balance.

6 Procedure

6.1 Test portion

The test portion is the analysis sample obtained by reduction of the contract sample according to ISO 664.

Weigh the test portion with a precision of at least 0,1 %.

6.2 Determination

The determination of impurities content shall be carried out sufficiently quickly to avoid any appreciable change in the moisture content of the seed.

Non-oleaginous impurities, % (m/m)

$$I_n = m_{2a} + \left(m_{2b} \times \frac{m_a}{m_b} \right) \times \frac{100}{m_0}$$

Oleaginous impurities, % (m/m)

$$I_o = \left(m_{3a} + m_{3b} \times \frac{m_a}{m_b} \right) \times \frac{100}{m_0}$$

Total impurities, % (m/m)

$$I_t = P + I_n + I_o$$

where

m_0 is the mass, in grams, of the initial test portion;

m_1 is the mass, in grams, of the fines;

m_{2a} is the mass, in grams, of the fraction of non-oleaginous impurities larger than seeds of the basic species and separated from the whole test portion;

m_{2b} is the mass, in grams, of the fraction of non-oleaginous impurities of approximately the same size as seeds of the basic species and separated from the aliquot portion of the residue obtained by eliminating, from the test portion, fines and impurities larger than seeds of the basic species;

m_{3a} is the mass, in grams, of the fraction of oleaginous impurities larger than seeds of the basic species and separated from the whole test portion;

m_{3b} is the mass, in grams, of the fraction of oleaginous impurities of approximately the same size as seeds of the basic species and separated from the aliquot portion of the residue obtained by eliminating, from the test portion, fines and impurities larger than seeds of the basic species;

m_a is the mass, in grams, of the residue obtained by eliminating, from the test portion, fines and impurities larger than seeds of the basic species :

$$(m_a = m_0 - m_1 - m_{2a} - m_{3a})$$

m_b is the mass, in grams, of the aliquot portion of the mass of residue m_a, from which the impurities of approximately the same size as the basic species have been separated.

7.1.4 In the case of groundnut the percentages by mass shall be calculated as follows :

Total fines, % (m/m)

$$P = m_1 \times \frac{100}{m_0}$$

Foreign fines, % (m/m)

$$P_s = \frac{m_1 \times 100}{m_0} \left(1 - \frac{H_2}{H_1} \right)$$

Non-oleaginous impurities, % (m/m)

$$I_n = \frac{m_2 \times 100}{m_0}$$

Oleaginous impurities, % (m/m)

$$I_o = \frac{m_3 \times 100}{m_0}$$

Total impurities, % (m/m)

$$I_t = P_s + I_n + I_o$$

where

m_0 is the mass, in grams, of the test portion;

m_1, m_2, m_3 are the respective masses, in grams, of each category of impurities;

H_1 is the oil content, expressed as a percentage by mass, of the pure seed;

H_2 is the oil content, expressed as a percentage by mass, of the fines.

7.1.5 Take as the result the arithmetic mean of the two determinations, if the conditions of repeatability (see 7.2) are satisfied.

7.1.6 Report the results to two decimal places for impurities contents not exceeding 0,5 % (m/m) and to one decimal place for impurities contents above this limit.

7.2 Repeatability

The difference between the results of two determinations, carried out simultaneously or in rapid succession by the same analyst, shall not exceed the values indicated in table 2.

Table 2 — Permissible difference between results of two parallel determinations

Impurities content	Maximum permissible difference
% (m/m)	% (m/m)
Up to and including 0,5	0,2
Over 0,5 to 1,0 inclusive	0,4
Over 1,0 to 2,0 inclusive	0,6
Over 2,0 to 3,0 inclusive	0,8
Over 3,0 to 4,0 inclusive	1,0
Over 4,0 to 5,0 inclusive	1,2
Over 5,0 to 6,0 inclusive	1,4
Over 6,0	1,6