INTERNATIONAL STANDARD 520

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Cereals and pulses — Determination of the mass of 1 000 grains

Céréales et légumineuses — Détermination de la masse de 1 000 grains

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FOREWORD

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO member bodies). The work of developing International Standards is carried out through ISO technical committees. Every member body interested in a subject for which a technical committee has been set up 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.

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 520 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 520-1966, which had been approved by the member bodies of the following countries :

Australia	Hungary	Romania
Canada	India	Spain
Chile	Israel	Switzerland
Czechoslovakia	Korea, Rep. of	Turkey
Egypt, Arab Rep. of	Netherlands	United Kingdom
France	New Zealand	U.S.S.R.
Germany	Poland	
Greece	Portugal	

No member body had expressed disapproval of the document.

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Cereals and pulses — Determination of the mass of 1 000 grains

1 SCOPE

This International Standard specifies a method for the determination of the mass of 1 000 grains of cereals and pulses.

2 FIELD OF APPLICATION

This International Standard is applicable to all cereals and pulses with the exception of seed lots for sowing purposes.

3 REFERENCE

ISO/R 712, *Cereals and cereal products — Determination of moisture content (Routine method).*

4 DEFINITIONS

4.1 mass of 1 000 grains as received : The mass of 1 000 grains including the moisture content at the time of the determination.

4.2 mass of 1 000 grains on the dry basis : The mass of 1 000 grains corrected for the moisture content at the time of the determination.

5 PRINCIPLE

Weighing a quantity of the sample, separation of the whole grains and weighing the residue, followed by counting of the whole grains. Division of the mass of the whole grains by their number, and expression of the result in relation to 1 000 grains.

6 APPARATUS

6.1 Dividing apparatus (if necessary).

6.2 Appropriate apparatus for counting grains (for example a photoelectric counter). If suitable apparatus is not available, counting may be carried out by hand.

6.3 Balance, accurate to 0,01 g.

7 PROCEDURE

7.1 Determination of the mass of 1 000 grains as received

Take at random an amount approximating to the mass of 500 grains from the sample as received and weigh to the nearest 0,01 g. Select the whole grains, weigh the residue to the nearest 0,01 g, and calculate by difference the mass of the whole grains; then count the latter.

Carry out tests in duplicate.

7.2 Determination of the mass of 1 000 grains on the dry basis

If the mass of 1 000 grains is to be referred to the dry basis, determine the moisture content of the whole grains free of impurities in a separate sample, in accordance with the routine method specified in ISO/R 712. This method, however, may be applied only to cereals. In the case of pulses, a method of drying at a temperature not higher than 105 °C shall be used.

8 EXPRESSION OF RESULTS

8.1 Method of calculation and formulae

8.1.1 The mass m_H of 1 000 grains as received is given by the formula

$$m_H = \frac{m_o \times 1\,000}{N}$$

where

m_o is the mass, in grams, of the whole grains;

N is the number of whole grains in the mass m_o.

8.1.2 The mass m_s of 1 000 grains on the dry basis is given by the formula

$$m_s = \frac{m_H \times (100 - H)}{100}$$

where H is the moisture content, expressed as a percentage by mass, of the grains as received.

8.1.3 Take as the result the arithmetic mean of the duplicate tests, provided that the requirement concerning repeatability (see 8.2) is satisfied.

If not, make a redetermination and take the average of the test results in the second determination, provided that the requirement concerning repeatability (see 8.2) is satisfied.

Express the result indicating the mass of 1 000 grains in grams

- to the second decimal place, if the mass is below 10 g;
- to the first decimal place, if the mass is 10 g or more but does not exceed 100 g;
- as a whole number, if the mass exceeds 100 g.

8.2 Repeatability

The difference between the results of duplicate tests carried out simultaneously or in rapid succession should not exceed 6 % for grains having a mass greater than 25 g per 1 000 grains and 10 % for other grains.

9 NOTES ON PROCEDURE

9.1 Samples containing decorticated and non-decorticated grains

If the sample contains a mixture of decorticated and non-decorticated grains, the two kinds shall be treated and counted separately.

9.2 Samples containing twin oat grains

Twin oat grains shall be separated from one another and counted as two grains.

10 TEST REPORT

The test report shall show the method used and the result obtained. It shall also mention all operating details not specified in this International Standard, or regarded as optional, and any circumstances that may have influenced the result. In particular, it shall be stated whether a retest has been necessary.

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