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Indian Standard

METHOD OF ANALYSIS FOR FOODGRAINS

PART 4 DETERMINATION OF THE MASS OF 1 000 GRAINS

( First Revision )

ICS 67.060

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

September 2002
NATIONAL FOREWORD

This Indian Standard (Part 4) (First Revision) which is identical with ISO 520:1977 'Cereals and pulses — Determination of the mass of 1 000 grains' issued by the International Organization for Standardization (ISO) was adopted by the Bureau of Indian Standards on the recommendation of the Foodgrains, Foodgrain Industries and Starches Sectional Committee and approval of the Food and Agriculture Division Council.

This standard was first published in 1968. In this revision, it is being aligned with the corresponding ISO Standard under dual numbering.

In the adopted standard, certain terminology and conventions are not identical to those used in Indian Standards. Attention is particularly drawn to the following:

a) Wherever the words 'International Standard' appear referring to this standard, they should be read as 'Indian Standard'; and

b) Comma (,) has been used as a decimal marker while in Indian Standards, the current practice is to use a point (.) as the decimal marker.

CROSS REFERENCES

In this adopted standard, the following International Standard is referred to. Read in its respective place, the following:

<table>
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In reporting the result of a test or analysis made in accordance with this standard, if the final value, observed or calculated, is to be rounded off, it shall be done in accordance with IS 2:1960 'Rules for rounding off numerical values (revised)'. 
Indian Standard

METHOD OF ANALYSIS FOR FOODGRAINS

PART 4 DETERMINATION OF THE MASS OF 1 000 GRAINS

( First Revision )

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

\[
m_H = \frac{m_o \times 1000}{N}
\]

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 $m$ of 1000 grains on the dry basis is given by the formula

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

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 1000 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 1000 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.
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This Indian Standard has been developed from Doc : No. FAD 16 (1197).

Amendments Issued Since Publication

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Printed at New India Printing Press, Khurja, India