

INTERNATIONAL STANDARD

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Fruit and vegetable products — Determination of water-insoluble solids

*Produits dérivés des fruits et légumes — Détermination du résidu sec
insoluble dans l'eau*



Reference number
ISO 751:1998(E)

Foreword

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International Standard ISO 751 was prepared by Technical Committee ISO/TC 34, *Agricultural food products*, Subcommittee SC 3, *Fruit and vegetable products*.

This second edition cancels and replaces the first edition (ISO 751:1981), which has been technically revised.

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Fruit and vegetable products — Determination of water-insoluble solids

1 Scope

This International Standard specifies a method for the determination of the content of water-insoluble solids in the edible parts of fruit and vegetable products.

2 Principle

The water-soluble matter in a test portion is dissolved in water, followed by filtration, drying of the residue and weighing.

3 Apparatus

Usual laboratory apparatus and, in particular, the following.

- 3.1 **Beakers**, of capacity 250 ml or 400 ml.
- 3.2 **Buchner funnel**.
- 3.3 **Filter paper**, medium texture.
- 3.4 **Indicator paper**.
- 3.5 **Weighing vessel**.
- 3.6 **Desiccator**, containing an efficient desiccant.
- 3.7 **Oven**, capable of being maintained at $103\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$.
- 3.8 **Centrifuge**.
- 3.9 **Analytical balance**, capable of weighing to the nearest 0,001 g.

4 Sampling

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

Sampling is not part of the method specified in this International Standard. As there is no specific International Standard dealing with fruit and vegetable products, it is recommended that the parties concerned come to an agreement on the subject.

5 Preparation of test sample and of apparatus

5.1 Preparation of test sample

Separate and remove from the laboratory sample stalks, stones, hard seed-cavity walls and, whenever possible, pips (after thawing in the case of frozen or deep-frozen products). Mix the sample thoroughly.

Allow frozen or deep-frozen products to thaw in a closed vessel and add the liquid formed during this process to the product before mixing.

If it is desired to express the result in terms of the sample as received, weigh the latter before removing stalks, stones, etc. Weigh these after washing and drying and take them into account in the expression of results (see 8.2).

5.2 Preparation of apparatus

Place a filter paper (3.3) in the weighing vessel (3.5) and dry in the oven (3.7) set at 103 °C for 30 min. Cool in the desiccator (3.6) and weigh to the nearest 0,001 g.

6 Procedure

NOTE If it is required to check whether the repeatability requirement (clause 9) is met, carry out two single determinations in accordance with 6.1 to 6.2.

6.1 Test portion

Weigh, to the nearest 0,01 g, into a 250 ml beaker (3.1) (400 ml in the case of sweetened products) 10 g to 100 g of the test sample (5.1), according to the consistency of the product and the expected content of water-insoluble solids; for example:

— tomato concentrates	10 g
— jam, fruit preserves	25 g
— pulpy products	50 g
— fruit and vegetable juices	100 g

NOTE For liquid products, it is also possible to take the test portion by volume.

6.2 Determination

Add 100 ml to 150 ml of distilled water or water of equivalent purity to the beaker containing the test portion (6.1). Stir with a glass rod until a homogeneous mixture is obtained. Heat to boiling (in the case of sweetened products, see 7.3).

Pour the contents of the beaker quantitatively onto the dried filter paper (see 5.2) placed in the Buchner funnel (3.2) and filter (see 7.4). Wash the filter paper with a little hot water.

Transfer the filter paper and its contents quantitatively to the weighing vessel (see 5.2) and dry in the oven (3.7), set at 103°C, to constant mass; i.e. until the difference between two consecutive weighings, after 30 min in the oven followed by cooling in the desiccator for about 20 min, does not exceed 0,001 g. Carry out the weighings to the nearest 0,001 g.

7 Special cases

7.1 Grape juice

If crystals of potassium hydrogen tartrate are found to be present in grape juice, the quantity should be determined. For this purpose, using another test portion, collect the crystals on a filter, wash them with the same juice and then with 50 % (V/V) ethanol solution saturated with potassium hydrogen tartrate.

Dry and weigh the crystals. The mass of the crystals of potassium hydrogen tartrate shall be recorded in the test report.

7.2 Citrus products

A similar procedure should be followed when crystals of hesperiden or naringin are present in citrus products.

7.3 Sweetened products

For the analysis of sweetened products, add about 250 ml of water. Bring to the boil and boil gently for 5 min to 10 min.

7.4 Products difficult to filter

If it proves difficult to filter the product (products with high contents of pectin or protein), or in the case of products having high sugar contents (fruit preserves, jam, etc.), separate the solid matter by means of a centrifuge (3.8). Decant the clear liquid, recover the residue (deposit) with hot water and again centrifuge. Repeat these operations several times, until the washings are free from sugars, salts, acids, etc., then collect the residue obtained by centrifuging on the filter, as described in 6.2.

8 Expression of results

8.1 The content of water-insoluble solids in the edible parts of fruit and vegetable products, expressed as a percentage by mass, is equal to

$$(m_2 - m_1) \times \frac{100}{m_0}$$

where

m_0 is the mass, in grams, of the test portion (6.1);

m_1 is the mass, in grams, of the weighing vessel and dried filter paper (5.2);

m_2 is the mass, in grams, of the weighing vessel, filter paper and residue after drying (6.2).

8.2 It is also possible to express the result in relation to the sample as received (see 5.1) or, for liquid products, in grams per 100 ml for a test portion taken by volume.

9 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 0,1 g of water-insoluble solids per 100 g of sample.

10 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, together with reference to this International Standard;
- all operating details not specified in this International Standard, or regarded as optional, together with details of any incidents which may have influenced the test result(s);
- the test result(s) obtained;
- if the repeatability has been checked, the final quoted result obtained.

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