# INTERNATIONAL STANDARD 3728

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# Ice-cream and milk ice — Determination of total solids content (Reference method)

*Crème glacée et glace au lait — Détermination de la teneur en matière sèche totale (Méthode de référence)*

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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 3728 was drawn up by Technical Committee ISO/TC 34, *Agricultural food products*, and was circulated to the Member Bodies in February 1975.



It has been approved by the Member Bodies of the following countries :



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|---|---|---|
| Austria | Germany | Poland |
| Belgium | Ghana | Romania |
| Brazil | Hungary | South Africa, Rep. of |
| Bulgaria | India | Spain |
| Canada | Iran | Turkey |
| Chile | Israel | United Kingdom |
| Czechoslovakia | Mexico | Yugoslavia |
| Ethiopia | Netherlands | |
| France | New Zealand | |

The Member Body of the following country expressed disapproval of the document on technical grounds :

Australia

NOTE – The method specified in this International Standard has been developed jointly with the IDF (International Dairy Federation) and the AOAC (Association of Official Analytical Chemists, U.S.A.).

The text as approved by the above organizations has also been published by the IDF (IDF Standard No. 70).



Printed in Switzerland

# Ice-cream and milk ice — Determination of total solids content (Reference method)

## 1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies a reference method for the determination of the total solids content of ice-cream, milk ices and similar products.

## 2 REFERENCE

ISO 707, *Milk and milk products — Sampling.*[1]

## 3 DEFINITION

**total solids content of ice-cream or milk ice :** The percentage by mass of material remaining after drying by the procedure specified.



## 4 PRINCIPLE



Drying, at 102 °C, of a known quantity of the sample, diluted with water and mixed with sand, to constant mass, followed by weighing to determine the mass of the residue.

## 5 APPARATUS AND MATERIALS

**5.1 Analytical balance.**

**5.2 Desiccator** containing an efficient drying agent.

**5.3 Drying oven,** well ventilated and capable of being controlled at 102 ± 2 °C.

**5.4 Flat dish,** non-corrodible under the test conditions, about 25 mm deep and about 75 mm in diameter, with well-fitting lid.

**5.5 Water bath,** capable of being controlled at 45 ± 1 °C.

**5.6 Boiling water bath.**

**5.7 Flat-ended glass rod.** The total length of the rod shall be slightly less than the diameter of the dish (5.4).

**5.8 Quartz sand** or **sea sand** which passes through a sieve with nominal size of aperture 500 μm but is retained on a sieve of nominal size of aperture of 180 μm.[2] The sand shall be washed successively with concentrated hydrochloric acid and distilled water, dried and ignited.

NOTE — Acid-washed sand is commercially available.

The acid-washed sand shall pass the following test for suitability. Dry about 25 g of the sand to constant mass at a temperature of 102 ± 2 °C in the oven (5.3). Cool. Weigh to the nearest 0,1 mg. Moisten the sand with distilled water, dry again to constant mass, cool and weigh to the nearest 0,1 mg. The difference between the two masses shall not exceed 0,5 mg.

## 6 SAMPLING

See ISO 707.[3]

## 7 PROCEDURE

### 7.1 Preparation of the test sample

For samples taken in small packages, remove the packaging and place the sample in a clean, dry container fitted with an airtight closure.

For samples taken from bulk or from large packages, keep them in their sampling containers.

In either case, melt the sample by standing the container in the water bath (5.5) controlled at 45 ± 1 °C for just enough time to allow the sample to become a homogeneous, smooth paste.

1) In preparation. (Revision of ISO/R 707-1968.)

2) See ISO 565.

3) Pending the publication of ISO 707, refer to the instructions given in the annex.

### 7.2 Determination

**7.2.1** Place about 25 g of the prepared sand (5.8) in the dish (5.4) and place the flat-ended glass rod (5.7) on the lid.

**7.2.2** Transfer the dish, with the lid and glass rod alongside, to the oven (5.3), controlled at 102 ± 2 °C, and leave for about 2 h.

**7.2.3** Place the lid and rod on the dish and transfer to the desiccator (5.2). Allow to cool to room temperature. Remove from the desiccator and weigh to the nearest 0,1 mg.

**7.2.4** Tilt the dish until the sand moves to one side, then place in the open space 3 to 4 g of the melted and well-mixed test sample (7.1). Weigh, together with the lid and glass rod, to the nearest 0,1 mg.

**7.2.5** Add about 3 ml of distilled water, mix with the test portion using the rod, then mix the diluted test portion thoroughly with the sand. Leave the stirring end of the rod in the mixture, the other end resting on the side of the dish. Place the dish on the boiling water bath (5.6) for about 30 min, carefully stirring during the early part of this period so that the mass when dry will not form a cake but will be well aerated and in the form of a crumbly mixture. Lay the rod flat in the dish.

**7.2.6** Transfer the dish, with the lid alongside, to the oven, controlled at 102 ± 2 °C, and leave for about 2 h.

**7.2.7** Place the lid on the dish and transfer it to a desiccator. Allow to cool to room temperature as before, remove from the desiccator and weigh to the nearest 0,1 mg.

**7.2.8** Repeat the heating for periods of 1 h, cooling and weighing until the loss of mass between successive weighings does not exceed 1 mg. If, before constant mass is reached, the mass shows an increase, record the lowest mass obtained.

## 8 EXPRESSION OF RESULTS

### 8.1 Method of calculation and formula

The total solids content, expressed as a percentage by mass, is equal to

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

where

$m_0$ is the mass, in grams, of the dish containing the sand, together with lid and glass rod (7.2.3);

$m_1$ is the mass, in grams, of the dish containing the sand and the test portion, together with lid and glass rod (7.2.4);

$m_2$ is the mass, in grams, of the dish, sand and residue, together with lid and glass rod, after drying (7.2.8).

### 8.2 Repeatability

The difference between the results of two determinations, carried out simultaneously or in rapid succession by the same analyst, using the same apparatus, shall not exceed 0,2 g of total solids per 100 g of the product.

## 9 TEST REPORT

The test report shall show the method used and the result obtained. It shall also mention all 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.

ANNEX

## SAMPLING

(This annex is valid only until the publication of ISO 707)

**A.1** With ice-cream or milk ices in small packages, complete units in their original wrapping should be sampled.

**A.2** With ice-cream and milk ices :

- in bulk (for sale in tea-rooms, restaurants, in the street or from soft-ice vending machines),
- in large packages,

30 to 50 g of the product or more, if necessary, should be taken. The samples should be taken from as many spots as possible. They should be kept at a temperature of − 5 °C maximum in wide-necked flasks with screw caps.

**A.3** The samples (A.1 and A.2) must be maintained in the frozen state before analysis and transported to the laboratory in refrigerated containers. If the analysis is not carried out immediately, they should be kept under refrigeration at a temperature of − 5 °C maximum.

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