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## Instant dried milk — Determination of the dispersibility and wettability

*Poudre de lait instantanée — Détermination de la dispersibilité et de  
la mouillabilité*

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## Forewords

**ISO (the International Organization for Standardization)** is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established 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. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see [www.iso.org/directives](http://www.iso.org/directives)).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see [www.iso.org/patents](http://www.iso.org/patents)).

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 34, *Food and food products*, Subcommittee SC 5, *Milk and milk products* and the International Dairy Federation (IDF). It is being published jointly by ISO and IDF.

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**IDF (the International Dairy Federation)** is a non-profit private sector organization representing the interests of various stakeholders in dairying at the global level. IDF members are organized in National Committees, which are national associations composed of representatives of dairy-related national interest groups including dairy farmers, dairy processing industry, dairy suppliers, academics and governments/food control authorities.

ISO and IDF collaborate closely on all matters of standardization relating to methods of analysis and sampling for milk and milk products. Since 2001, ISO and IDF jointly publish their International Standards using the logos and reference numbers of both organizations.

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This document was prepared by the IDF Standing Committee on *Analytical Methods for Composition* and ISO Technical Committee ISO/TC 34, *Food and food products*, Subcommittee SC 5, *Milk and milk products*.

This IDF Reviewed method is equal to an ISO Publicly Available Specification (ISO/PAS) or an ISO Technical Specification (ISO/TS) and is therefore published jointly under ISO conditions.

The work was carried out by the IDF/ISO Project Group C28 of the Standing Committee on *Analytical Methods for Composition* under the aegis of its project leader, Dr. Steve Holroyd (NZ).

This ISO Technical Specification/IDF Reviewed Method replaces the standard IDF 87:1979, *Instant dried milk — Determination of the dispersibility and wettability* which has been withdrawn.

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## Introduction

The degree to which a dried milk is “instant” depends on various properties which can be classified as wettability, sinkability, dispersibility, and solubility. The first three affects the last to some extent and, hence, dispersibility, as defined and determined in this Technical Specification, is probably the best single criterion for assessing the overall instant characteristics of a dried milk. Provisional recommendations for acceptable dispersibility values for instant dried skimmed milk and instant dried whole milk are given in [Annex A](#). Although wettability is a property not easily distinguishable from sinkability and is difficult to measure accurately, in milk powders, an approximate determination of wettability, which can be made rapidly, provides a useful indication of the degree to which a dried milk is likely to possess instant characteristics. In [Annex B](#), a rapid routine method for the determination of the wettability (wetting time) in water of instant dried milk is described.

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# Instant dried milk — Determination of the dispersibility and wettability

## 1 Scope

This Technical Specification specifies a method for the determination of the dispersibility in water of instant dried milk.

The method is applicable to instant dried skimmed milk manufactured by either the “straight-through” or the “re-wet” process and also to instant dried whole milk.

## 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 5537|IDF 26, *Dried milk — Determination of moisture content (Reference method)*

ISO 6731|IDF 21, *Milk, cream and evaporated milk — Determination of total solids content (Reference method)*

## 3 Principle

A test portion of the sample of known moisture content is evenly spread on the surface of water at a temperature of 25 °C. The mixture is stirred manually for a short time; then, part of the mixture is filtered through a sieve, and the total solids content of the collected liquid determined. Dispersibility is calculated from the mass of the test portion and the values for moisture content and total solids content.

## 4 Reagents

Use only distilled or demineralized water or water of equivalent purity.

## 5 Apparatus

**5.1 Container**, capacity about twice the volume of the laboratory sample ([Clause 6](#)), with airtight lid.

**5.2 Apparatus**, as specified in ISO 5537|IDF 26.

**5.3 Balance**, top-pan, capable of being read to the nearest 0,1 g.

**5.4 Scoop**, suitable for transporting the test portion ([8.3.2](#)) for weighing.

**5.5 Thermometer**, suitable for measuring a temperature of  $(25 \pm 1)$  °C.

**5.6 Glass beaker**, with spout, capacity 600 ml, external diameter  $(90 \pm 2)$  mm, overall height  $(126 \pm 3)$  mm, graduated at 150 ml and 250 ml, with the rim lying in a horizontal plane parallel to the base [see [Figure 1 a](#)].

**5.7 Glass plate**, 120 mm × 120 mm, thickness 2,5 mm, with ground edges [see [Figure 1 a](#)].

**5.8 Glass tubing**, length 65 mm, outside diameter  $(80 \pm 1,8)$  mm, wall thickness  $(2,5 \pm 0,3)$  mm, with the ends ground, parallel, and at right angles to the longitudinal axis [see [Figure 1 a](#)].

**5.9 Stand and clamp**, for holding the glass tubing ([5.8](#)).

**5.10 Brush**, suitable for removing the test portion from the scoop ([5.4](#)).

**5.11 Spatula**, stainless steel, thickness 1 mm, overall length 250 mm, length of blade 135 mm, width of blade 25 mm [see [Figure 1 b](#)].

These dimensions should be adhered to as closely as possible.

**5.12 Stopwatch**, 60 s, numbered at intervals of 5 s, indicating intervals of 1 s and 0,5 s (or less).

It is helpful to have the dial marked at 5 s, 25 s, and 55 s.

**5.13 Test sieve**, diameter 200 mm, woven metal wire cloth, nominal size of apertures 150  $\mu\text{m}$ , with receiver, complying with ISO 565[1].

**5.14 Conical flask**, capacity 250 ml, with stopper.

**5.15 Glass funnel**, suitable for transferring the contents of the sieve receiver to the conical flask (see [8.3.9](#)).

**5.16 Apparatus**, as specified in ISO 6731|IDF 21

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## 6 Sampling

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Sampling is not part of the method specified in this Technical Specification. A recommended sampling method is given in ISO 707|IDF 50[2].

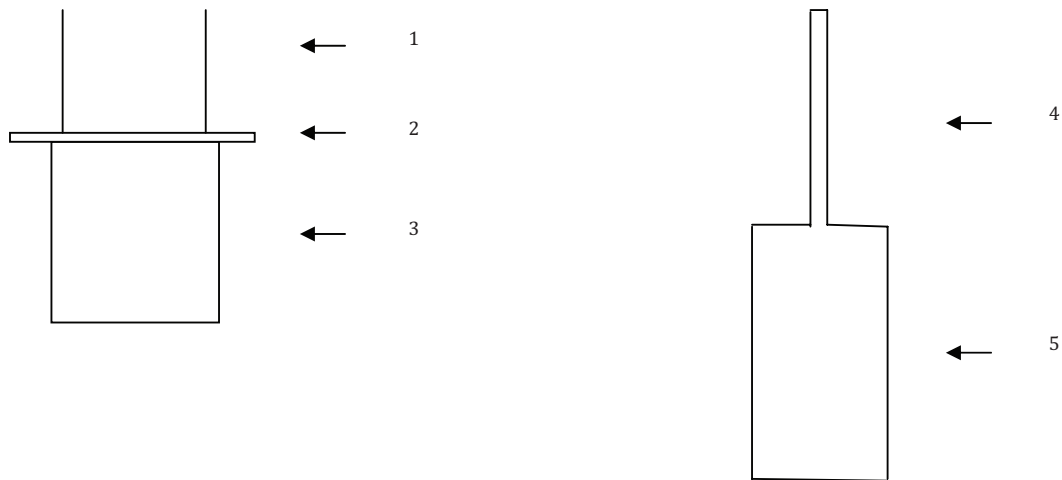
It is important that the laboratory receives a representative sample which has not been damaged or changed during transport or storage.

The laboratory sample shall be placed in a clean, dry, securely closed, airtight container. With instant dried milk, it is essential that care is taken during sampling to avoid reducing the particle size of the dried milk and to prevent this happening during transport of the laboratory sample, the sample container should be completely filled. Note and report any deviation from these requirements.

## 7 Preparation of test sample

Transfer all the laboratory sample, which should be at ambient temperature, to the container ([5.1](#)) and immediately close the container. Thoroughly mix the sample by very gently inverting and rotating the container in such a way as to avoid reducing the particle size of the sample.





#### Key

- |   |                    |   |                       |
|---|--------------------|---|-----------------------|
| 1 | glass tubing (5.8) | 4 | spatula (5.11) handle |
| 2 | glass plate (5.7)  | 5 | spatula (5.11) blade  |
| 3 | glass beaker (5.6) |   |                       |

**Figure 1 — Apparatus for the determination of dispersibility and wetting time (diagrammatic)**  
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## 8 Procedure

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### 8.1 Pretreatment of test sample

Before proceeding with the operations specified in 8.2 and 8.3, ensure that the test sample (Clause 7) has been at laboratory temperature (20 °C to 25 °C) for at least 48 h. This pretreatment is necessary with all test samples so that any influence on dispersibility attributable to the physical state of the fat is constant from sample to sample.

### 8.2 Moisture content of pretreated test sample

Carry out, in duplicate, the procedure specified in ISO 5537/IDF 26 to obtain two single values (to the nearest 0,01 % mass fraction) for the moisture content of the pretreated test sample (8.1). Record the mean of these values, to the nearest 0,1 % mass fraction, as the moisture content.

### 8.3 Test method

**8.3.1** Carry out the test method in duplicate to obtain duplicate single values for dispersibility.

**8.3.2** Mix the pretreated test sample (8.1) by very gently inverting and rotating the container a few times. Using the balance (5.3), weigh out in the scoop (5.4) (26 ± 0,1) g of instant dried skimmed milk or (34 ± 0,1) g of instant dried whole milk.

**8.3.3** Weigh out (250 ± 0,1) g of water, adjusted to (25 ± 1) °C, in a dry glass beaker (5.6), taking care that the inside of the beaker above the final water level remains dry.

NOTE Recommended water temperature is 25 °C. In laboratories, for skimmed milk powder, water temperature used is 25 °C and for whole milk powder, water temperature is 40 °C.