INTERNATIONAL STANDARD

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IDF 174

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Instant whole milk powder — Determination of white flecks number

Lait entier instantané en poudre — Détermination du nombre de taches blanches

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Foreword

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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.

ISO 11865 | IDF 174 was prepared by Technical Committee ISO/TC 34, *Food products*, Subcommittee SC 5, *Milk and milk products*, and the International Dairy Federation (IDF). It is being published jointly by ISO and IDF.

This second edition of ISO 11865 | IDF 174 cancels and replaces the first edition (ISO 11865:1995), of which it constitutes a minor revision.

Foreword

IDF (the International Dairy Federation) is a non-profit organization representing the dairy sector worldwide. IDF membership comprises National Committees in every member country as well as regional dairy associations having signed a formal agreement on cooperation with IDF. All members of IDF have the right to be represented on the IDF Standing Committees carrying out the technical work. IDF collaborates with ISO in the development of standard methods of analysis and sampling for milk and milk products.

The main task of Standing Committees is to prepare International Standards. Draft International Standards adopted by the Action Teams and Standing Committees are circulated to the National Committees for voting. Publication as an International Standard requires approval by at least 50 % of the IDF National Committees casting a vote.

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ISO 11865 | IDF 174 was prepared by the International Dairy Federation (IDF) and Technical Committee ISO/TC 34, *Food products*, Subcommittee SC 5, *Milk and milk products*. It is being published jointly by IDF and ISO.

All work was carried out by the former Joint ISO-IDF Group of Experts (E701 — *Physical properties of dried milk products*) which is now part of the dormant Joint ISO-IDF Action Team on *Physical properties and rheological tests* of the Standing Committee on *Minor components and characterization of physical properties*.

This edition of ISO 11865 | IDF 174 cancels and replaces IDF 174:1993, of which it constitutes a minor revision.

Instant whole milk powder — Determination of white flecks number

1 Scope

This International Standard specifies a method for the determination of the white flecks number (WFN) in instant whole milk powder.

2 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

2.1
white flecks
undissolved particles which are visible when reconstituted milk is observed in a thin layer

2.2
white flecks number
WFN
volume fraction of liquid which has not passed the sieve within 15 s when the procedure specified in this International Standard is followed

3 Principle

Contrary to slowly dispersible particles, white flecks easily clog a filter or a fine mesh because they are numerous and soft. This property is used for their determination. The volume of liquid which remains on a defined sieve after a given time is therefore an expression of the amount of white flecks.

4 Apparatus

Usual laboratory equipment and, in particular, the following.

4.1 Analytical balance, capable of being read to the nearest 0,1 g.

4.2 Glass beaker, of capacity 400 ml, of inside diameter 70 mm and height 130 mm.

4.3 Spatula, of stainless steel, of thickness 1 mm and overall length 250 mm, with length and width of blade 135 mm and 25 mm, respectively.

4.4 Sieve, of diameter 100 mm, height about 45 mm and nominal size of openings 63 µm (see ISO 3310-1[2])[1)].

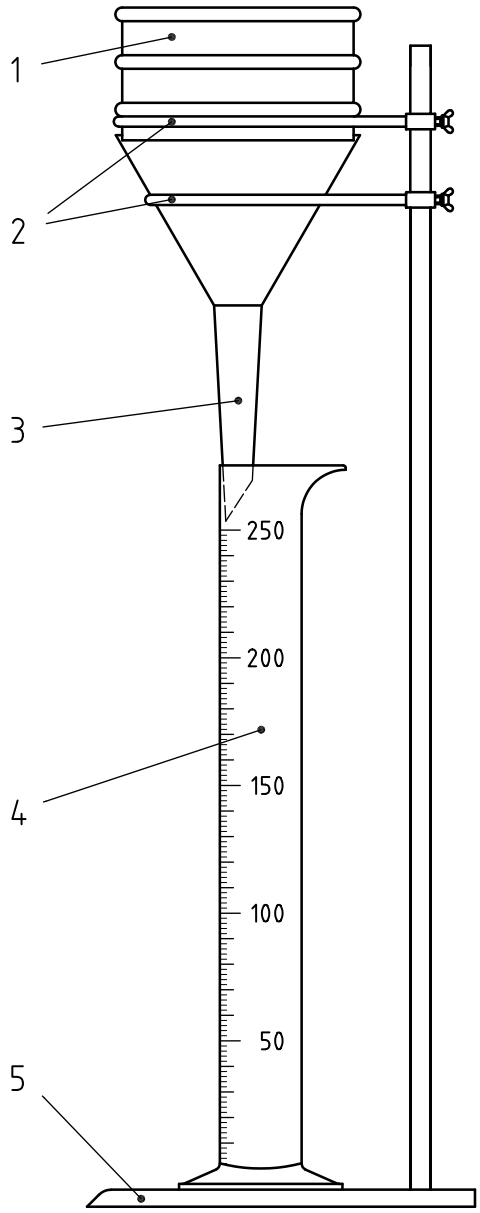
1) A sieve produced by Siebtechnik is an example of a suitable product available commercially. This information is given for the convenience of users of this International Standard and does not constitute an endorsement by ISO or IDF of this product.

4.5 Glass funnel, of diameter 110 mm to 120 mm (see Figure 1).

4.6 Laboratory stand, with two rings, one for the sieve and one for the glass funnel (see Figure 1).

4.7 Measuring cylinder, of capacity 250 ml, graduated in 2 ml intervals.

4.8 Stopwatch.



Key

1 sieve, of diameter 100 mm and aperture size 63 µm
2 supporting rings
3 glass funnel, of diameter 110 mm to 120 mm
4 measuring cylinder, 250 ml
5 laboratory stand

Figure 1 — Stand with sieve and funnel (see Reference [5])

5 Sampling

Sampling is not part of the method specified in this International Standard. A recommended sampling method is given in ISO 707|IDF 50[1].

A representative sample should have been sent to the laboratory. It should not have been damaged or changed during transport or storage.

6 Preparation of test sample

Mix the laboratory sample well and take test samples directly from it.

7 Procedure

7.1 If a check is required of whether the repeatability requirement (9.2) is met, carry out two single determinations in accordance with 7.2 to 7.8 under repeatability conditions.

7.2 Wet the sieve (4.4) and remove excess water using a filter paper. Fit the sieve and glass funnel (4.5) into the rings of the stand (4.6), placing the measuring cylinder (4.7) below the funnel so that the stem is positioned as shown in Figure 1.

Adjust the sieve to a horizontal position.

7.3 Measure 100 ml ± 1 ml of water, at a temperature of 20 °C ± 1 °C, in a dry glass beaker (4.2). Add 24 g ± 0,1 g of test sample to the beaker, simultaneously starting the stopwatch (4.8).

7.4 When the stopwatch indicates 5 s, insert the spatula down the side of the beaker until it touches the bottom. Over the next 5 s, stir the contents of the beaker with the spatula, making one complete stirring movement per second. Use a smooth continuous movement of the spatula across the beaker from one side to the other and back for 1 s, keeping the end of the spatula blade in continuous contact with the bottom of the beaker. Slightly tilt the spatula away from the side of the beaker at the end of each half-stirring movement so as to minimize accumulation of unwetted test sample on the sides of the beaker. Without interruption, continue stirring for 15 s in the same manner, maintaining the spatula in a vertical position throughout. While making the 20 complete stirring movements in 20 s, continuously rotate the beaker on its base so that approximately one complete turn (360°) is achieved during the stirring.

7.5 After completion of the stirring, allow the contents of the beaker to stand for 30 s, i.e. until the stopwatch indicates 55 s, then add a further 100 ml ± 1 ml of water at 20 °C ± 1 °C. When the stopwatch indicates 60 s, repeat the stirring, making 20 complete stirring movements in 20 s while continuously rotating the beaker as described in 7.4. Stop the stopwatch.

7.6 Within about 5 s, pour off the liquid on the wetted sieve, and start the stopwatch again.

7.7 When the stopwatch shows 15 s, read the volume, V, of liquid in the measuring cylinder to the nearest 2 ml.

7.8 After each use, rinse the sieve under running water and wash in warm water containing detergent.

CAUTION — It is important to keep the sieve clean.

8 Calculation and expression of results

8.1 Calculation

Calculate the WFN, n_{wf}, using the formula:

$$n_{wf} = \frac{215 - V}{215}$$

where

215 is the numerical value of the calculated volume, in millilitres, of the reconstituted liquid used as test sample;

V is the numerical value of the volume of the filtrate, in millilitres, obtained in 15 s.

8.2 Expression of results

Take as the result the arithmetic mean of two results, if the repeatability requirement (9.2) is satisfied.

Express the result to two decimal places.

9 Precision

9.1 General

The values for repeatability limit and reproducibility limit have been derived from the results of an interlaboratory test carried out in accordance with ISO 5725:1986[3].

9.2 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, shall not exceed 0,02.

Reject both results if the difference exceeds 0,02 and carry out two new single determinations.

9.3 Reproducibility

The absolute difference between two single test results, obtained using the same method on identical test material in different laboratories with different operators using different equipment, shall not exceed 0,07.

10 Test report

The test report shall contain at least the following information:

a) the sampling method used, if known;

b) the test method used, including a reference to this International Standard;

c) the test result(s) obtained;

d) if the repeatability has been checked, the final quoted result obtained;

e) all operating details not specified in this International Standard, or regarded as optional, together with details of any incidents that may have influenced the test result(s);

f) all information required for the complete identification of the sample.

Bibliography

[1] ISO 707 | IDF 50, *Milk and milk products — Guidance on sampling*

[2] ISO 3310-1, *Test sieves — Technical requirements and testing — Part 1: Test sieves of metal wire cloth*

[3] ISO 5725:1986[2)], *Precision of test methods — Determination of repeatability and reproducibility for a standard test method by inter-laboratory tests*

[4] LITMAN, I.I., ASHWORTH, U.S. Insoluble scum-like materials on reconstituted whole milk powders. *J. Dairy Sci.* 1957, **40**, pp. 403-409

[5] GEA NIRO. *Analytical methods for dry milk products*, 4th edition. GEA Niro, Copenhagen, 1978. Available (2009-03-23) at: http://www.niro.com/niro/CMSDoc.nsf/webdoc/ndkw6dknxs

2) Superseded.

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