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IS 1165 (2002): Milk Powder [FAD 19: Dairy Products and Equipment]



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भारतीय मानक

दूध का पाउडर — विशिष्टि

(पाँचवाँ पुनरीक्षण)

Indian Standard

MILK POWDER — SPECIFICATION

(*Fifth Revision*)

ICS 67.100.01

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BUREAU OF INDIAN STANDARDS

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NEW DELHI 110002

FOREWORD

This Indian Standard (Fifth Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Dairy Products and Equipment Sectional Committee had been approved by the Food and Agriculture Division Council.

The milk production in our country is characterized by seasonal variations and drying of milk, an important method of preservation, facilitates later consumption during the lean season. The dried milk products, thus, have become an essential part of the chain between the producer and the consumer.

This Indian Standard was first published in 1957 and subsequently revised in 1967, 1975, 1986 and 1992. The standard is being revised in order to:

- a) Harmonize the presentation,
- b) Update the referred standards, and
- c) Update the methods of tests.

While formulating this standard due consideration has been given to the relevant rules prescribed by the Government of India under the *Prevention of Food Adulteration Act, 1954* and *Rules 1955* and *Standards of Weights and Measures (Packaged Commodities) Rules, 1977*. This standard is, however, subject to the restrictions imposed under these, wherever applicable.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (revised)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

AMENDMENT NO. 1 NOVEMBER 2012
TO
IS 1165 : 2002 MILK POWDER — SPECIFICATION
(Fifth Revision)

(Page 1, clause 2) – Insert the following at the end:

<i>‘IS No.</i>	<i>Title</i>
16072 : 2012	Determination of moisture content in milk powder and similar products (Routine method)’.

(Page 2, Table 1, Sl No. (i), col 4) — Substitute ‘IS 11623 for reference purpose and IS 16072 for routine purpose’ *for* ‘IS 11623’.

(Page 2, Table 1, Note) — Substitute the following in place of the existing note:

‘NOTE — From the mass of residue, as obtained in the method prescribed in IS 11623 or IS 16072, calculate the percentage of total solids.’

Indian Standard

MILK POWDER — SPECIFICATION

(Fifth Revision)

1 SCOPE

This standard prescribes the requirements, methods of sampling and test for milk powder.

2 REFERENCES

The Indian Standards listed below contain provisions, which through reference in this text constitute provision of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated:

<i>IS No.</i>	<i>Title</i>
323 : 1959	Specification for rectified spirit
1224 (Part 2) : 1997	Determination of milk fat by the Gerber method : Part 2 Milk products
2491 : 1998	Food hygienic — General principal — Code of practice (<i>second revision</i>)
4905 : 1968	Methods for random sampling
5401 : 1969	Methods for detection and estimation of coliform bacteria in foodstuffs
5402 : 1969	Methods for plate count of bacteria in foodstuffs
5887 (Part 2) : 1976	Methods for detection of bacteria responsible for food poisoning: Isolation, identification and enumeration of <i>Staphylococcus Aureus</i> and <i>fecal streptococci</i> (<i>first revision</i>)
(Part 3) : 1993	General guidance on method for detection of <i>Salmonella</i> (<i>second revision</i>)
(Part 7) : 1999	General method for isolation and identification of <i>Shigella</i>
8069 : 1989	High density polyethylene (HDPE) woven sacks for packing pesticides (<i>second revision</i>)
10030 : 1981	Method for sensory evaluation of milk powder

*IS No.**Title*

10171 : 1999	Guide on suitability of plastic for food packaging (<i>second revision</i>)
11078 : 1993	Round open top sanitary cans for milk powder (<i>first revision</i>)
11546 : 1985	Methods of sampling for milk and milk products
11623 : 1986	Method for determination of moisture content in milk powder and similar products
11721 : 1986	Determination of fat content in milk powder and similar products (<i>reference method</i>)
12759 : 1989	Dried milk and dried milk products — Determination of insolubility index

3 REQUIREMENTS**3.1 Description**

The material shall be white or white with greenish tinge or light cream in colour. It shall be free from lumps except those that break up readily under slight pressure and shall be reasonably free from scorched particles. It shall also be free from extraneous matter.

3.2 Flavour and Taste

The flavour of the product or of the reconstituted milk shall be pleasant and clean. It shall be free from off flavours (may have slightly cooked but not the burnt flavour). It is recommended that the flavour and taste may be judged on the basis of their sensory characteristics (*see* IS 10030).

3.3 Hygienic Conditions

The product shall be manufactured and packed under hygienic conditions as per IS 2491.

3.4 Milk Powder

3.4.1 It shall be the material prepared by spray drying of standardized milk obtained from fresh cow milk or buffalo milk or a mixture thereof (the standardized milk shall be prepared by adjustment of suitably processed milk solids). The standardized milk shall be free from additives. All processing and drying should be carried out in a manner that minimizes the loss of nutritive value, particularly protein quality.

3.4.2 For improving the disperseability of the product, lecithin to a maximum extent of 0.5 percent by mass may be added and declared on the label as per the *PFA* Rules.

3.4.3 The product may contain added calcium chloride, citric acid and sodium citrate, sodium salts of orthophosphoric acid and polyphosphoric acid (as linear phosphate), not exceeding 0.3 percent by mass of the finished product. Such additions need not be declared on the label.

3.4.4 Milk powder may contain a maximum of 0.01 percent of butylated hydroxyanisole (BHA) by mass of the finished product.

3.4.5 The product shall also conform to the requirements given in Table 1.

3.5 Microbiological Requirements

3.5.1 Bacterial Count

The bacterial count per gram of the product shall not be more than 40 000 when determined according to the method prescribed in IS 5402.

3.5.2 Coliform Count

The coliform bacteria shall be absent in 0.1 g of the product when determined according to the method prescribed in IS 5401.

3.5.3 Staphylococcus Aureus

The coagulase positive *staphylococcus aureus* shall be absent in 0.1 g of the product when tested as per the procedure described in IS 5887 (Part 2).

3.5.4 Salmonella

Salmonella shall be absent in 25 g of the product when tested as per the procedure described in IS 5887 (Part 3).

3.5.5 Shigella

Shigella shall be absent in 25 g of the product when tested as per the procedure described in IS 5887 (Part 7).

NOTE — The requirements of *Salmonella* and *Shigella* shall be tested in a laboratory situated away from production area or in a recognized outside laboratory.

4 PACKING

4.1 Retail Packing

The milk powder shall be packed in clean and sound containers (see IS 11078) or in a food grade flexible pack made from a film or combination of any of the substrates made of board, paper, polyethylene, polyester metalized film or aluminium foil in such a way as to protect it from deterioration. The product shall be packed in nitrogen, carbon dioxide or a mixture thereof. The packages shall be hermetically sealed. In case of plastic material only food grade plastic (see IS 10171) shall be used.

NOTES

1 For food grade plastic material, Rule 49 (5) (v) of *PFA* Rules should also be referred.

2 In the case of flexible pack, the following information shall be marked on the label 'Once opened, the entire product content should immediately be placed in a clean air tight container'.

Table 1 Compositional Specification for Milk Powder

(Clause 3.4.5)

Sl No.	Characteristic	Requirement	Method of Test, Ref to
(1)	(2)	(3)	(4)
i)	Moisture, percent by mass, <i>Max</i>	4.0	IS 11623
ii)	Total solids, percent by mass, <i>Min</i>	96.0	See Note
iii)	Fat, percent by mass, <i>Min</i>	26.0	IS 11721 for reference purpose and 5 of IS 1224 (Part 2) for routine purposes
iv)	Insolubility index, <i>Max</i>	2.0 ml	IS 12759
v)	Total ash (on dry basis), percent by mass, <i>Max</i>	7.3	Annex A
vi)	Titrateable acidity (lactic acid), percent by mass, <i>Max</i>	1.2	Annex B

NOTE — From the mass of residue, as obtained in the method prescribed in IS 11623 calculate the percentage of total solids.

4.1.1 The product shall be packed in quantities as stipulated under the provisions of the *Standards of Weights and Measures (Packaged Commodities) Rules, 1977*.

4.1.2 Further encasing of individual retail packs may be carried out in bags/cartons of adequate strength as outlined in 4.2.

4.2 Bulk Packing

4.2.1 The product may be packed in quantities of 25 kg bags of food grade polyethylene (*see* IS 10171) of minimum thickness 0.05 mm. The bags should be properly closed by tying with a string or a rubber band. The bags can also be heat sealed, but ensure that inner side of bag is free from milk powder particles. The bag shall be subsequently encased in any of the following:

- a) Multi-walled Kraft paper, such as crepe Kraft paper bags of not less than 80 GSM (g/m) grade lined with hessian cloth having a mass of 270 GSM (g/m) and having two inner layers of plain Kraft paper of not less than 80 GSM (g/m) grade;
- b) Packs made out of 80 GSM (g/m) Kraft paper sandwich laminated to high density polyethylene woven fabric having construction as given in Annex A of IS 8069 with 20 GSM (g/m) polyethylene; and
- c) Any other newer packaging as alternative system provided these have been tested for strength, air-permeability, etc, by a recognized institution and found equivalent to the material specified in 4.2 a) and b) above. The material coming in direct contact with the product shall be of food grade.

4.2.2 The bags meant for reconstitution shall be stored below 20°C and a statement 'Not for direct consumption' but for 'Reconstitution only' shall be made on the package along with the date of manufacture. However, in case the moisture of these bags is maintained below 3.5 percent, the bags need not be stored below 20°C. Such bags shall have to be consumed within five months of their date of manufacture and this shall be given in the form of expiry date.

5 MARKING

5.1 The package shall bear legibly and indelibly the following information:

- a) Name of the material and brand name, if any;
- b) Name and address of the manufacturer;
- c) Type of material;
- d) Batch or code number;
- e) Process of drying;
- f) Month and year of manufacturing or packing;
- g) Net mass;
- h) Directions for storage;
- j) Best for consumption up to (month and year in capital letters);

OR

Best for consumption within (months) from the date of packing/manufacture;

- k) Direction for reconstitution;
- m) The contents of this container on reconstitution as per the directions have litre(s) toned milk;
- n) Information given under Note 2 of 4.1 if applicable; and
- p) Any other requirements under then *Standards of Weights and Measure (Packaged Commodities) Rules, 1977* and *Prevention of Food Adulteration Act, 1954* and Rules framed thereunder.

5.1.1 BIS Certification Marking

The product may also be marked with the Standard Mark.

5.1.2 The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act, 1986* and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

6 SAMPLING

Representative samples of the material shall be drawn and tested for conformity to this standard as prescribed in Annex C.

ANNEX A

[Table 1, Sl No. (v)]

DETERMINATION OF TOTAL ASH (ON DRY BASIS)

A-1 APPARATUS

A-1.1 Flat-Bottom Dish, of stainless steel, porcelain, silica or platinum.

A-1.2 Muffle Furnace, maintained at $550 \pm 20^{\circ}\text{C}$.

A-1.3 Desiccator

A-2 PROCEDURE

A-2.1 Weigh accurately 3 g of the material in the dish, previously dried in an air-oven and weighed. Heat the dish gently on a flame at first and then strongly in a muffle furnace till grey ash results. Cool the dish in a desiccator and weigh. Heat the dish again for 30 min in the muffle furnace. Cool the dish in a desiccator and weigh. Repeat this process of heating for 30 min, cooling and weighing until the

difference between two successive weighing is less than one milligram. Record the lowest mass.

A-3 CALCULATION

A-3.1 Total ash (on dry basis),
percent by mass $= \frac{100 (M_2 - M)}{(100 - M_0) (M_1 - M)}$

where

- M_2 = mass in g, of the dish with the ash;
- M = mass, in g, of the empty dish;
- M_1 = mass, in g, of the dish with the material taken for the test; and
- M_0 = moisture, percent by mass, calculated as per IS 11623.

ANNEX B

[Table 1, Sl No. (vi)]

DETERMINATION OF TITRABLE ACIDITY

B-1 APPARATUS

B-1.1 Burette, with soda-lime guard tube.

B-1.2 Porcelain Dishes, white hemispherical of approximately 60 ml capacity.

B-1.3 Stirring Rods, of glass, flattened at one end.

B-1.4 Pipettes, to deliver 10 ml and 1 ml.

B-2 REAGENTS

B-2.1 Standard Sodium Hydroxide Solution — 0.1 N

Prepare a concentrated stock solution of sodium hydroxide (sticks or pellets) and water in a flask. Tightly stopper the flask with a rubber bung and allow any insoluble sodium carbonate to settle down for 3 to 4 days.

B-2.1.1 Use the clear supernatant liquid for preparing the standard 0.1 N solution. About 8 ml stock solution is required per litre of distilled water.

B-2.2 Phenolphthalein Indicator Solution

Dissolve one gram of phenolphthalein in 100 ml of

rectified spirit (see IS 323). Add 0.1 N sodium hydroxide solution until one drop gives a faint pink colouration, dilute with distilled water to 200 ml.

B-2.3 Rosaniline Acetate Solution (Bench Solution)

Dilute 1 ml of the stock solution to 500 ml with a mixture of rectified spirit and distilled water in equal proportions by volume.

NOTE — The stock solution and the bench solution should be stored in dark-brown bottles securely with rubber bungs.

B-3 PROCEDURE

Weigh accurately about 1 g of the sample into each of the two porcelain dishes. Add 10 ml of boiling water to each dish and stir with the flat end of a glass rod until a perfectly smooth liquid is obtained. Cool to room temperature. Use the contents of one dish as a blank by stirring in 2 ml of bench solution of rosaniline acetate. Add 1 ml of phenolphthalein indicator solution of the other dish followed by standard sodium hydroxide solution introduced drop by drop from the burette until by comparison the colour matches the pink tint

of the blank. Stir vigorously throughout. The time taken for the complete titration shall not exceed 20 seconds. The titration shall be preferably made in north light or under illumination from a day light lamp.

B-4 CALCULATION

Titrateable acidity (as lactic acid),

$$\text{percent by mass} = \frac{9 AN}{M}$$

where

A = volume in ml of the standard sodium hydroxide required for titration,

N = normality of the standard sodium hydroxide solution, and

M = mass in g of milk powder taken for the test.

ANNEX C

(Clause 6)

SAMPLING OF MILK POWDER

C-1 GENERAL REQUIREMENTS

C-1.0 In drawing, preparing, storing and handling samples, in addition to the following precautions and directions, those given in 4 and 13 of IS 11546 should, as far as possible, be observed.

C-1.1 Precautions shall be taken to protect the samples, the material being sampled, the sampling instrument and the containers for samples from adventitious contamination.

C-1.2 The samples shall be placed in clean and dry glass containers. The sample containers shall be of such a size that they are almost completely filled by the sample. The sample containers shall in addition be sterile when they are used for sample for bacteriological examination.

C-1.3 Each container shall be sealed air-tight after filling and marked with full details of sampling, batch or code number, name of the manufacturer and other important particulars of the consignment.

C-1.4 Samples shall be stored in such a manner that the temperature of the material does not vary unduly from the normal temperature.

C-2 SCALE OF SAMPLING

C-2.1 Lot

All the containers in a single consignment of same type of material, drawn from a single batch of manufacture and of same size shall constitute a lot. If the consignment is declared to consist of different batches of manufacture, the batches shall be marked separately and the group of containers in each batch shall constitute separate lots.

C-2.1.1 For ascertaining the conformity of material

to the requirements of this specification, samples shall be tested from each lot separately.

C-2.2 The number of containers to be selected from the lot shall depend on the size of the lot, quantity of material in the container and shall be as given in Table 2.

C-2.3 These containers shall be selected at random from the lot. In order to ensure the randomness of selection, procedure given in IS 4905 may be followed.

C-3 TEST SAMPLES AND REFEREE SAMPLES

C-3.1 Preparation of Individual Sample

Draw with a suitable sampling instrument approximately equal quantities of material from different parts of the same container till about 150 g of material is obtained. This shall be divided into three equal parts. Each part so obtained, shall constitute an individual sample representing the container and shall be transferred immediately to thoroughly clean and dry containers sealed air-tight with the particulars given in C-1.3. The individual sample so obtained shall be divided into three sets in such a way that each set have a sample representing each selected container. One of these sets shall be marked for the purchaser, another for the vendor and the third for the referee.

C-3.2 From the selected containers, select a sub sample according to col 3 or col 6 of Table 2, as the case may be. Draw with a suitable sampling instrument which is sterile, at least 100 g of material and mix thoroughly under aseptic conditions to form sample of container for microbiological examination (for guidance and details (see 13.3.2 of IS 11546). Divide sample taking care not to bring any microbiological contamination in the material) into three equal parts. Each part so obtained shall constitute a sample representing the

container and shall be transferred to a sterile glass containers, sealed air-tight and labelled with particulars given in C-1.3. They shall be marked, in addition, with the words 'For Microbiological Examination'. The samples so obtained shall be divided into three sets in such a way that each set has a sample representing each selected container. One of these sets shall be marked for the purchaser, another for the vendor and the third for the referee.

C-3.3 Reference Samples

Referee sample shall consist of a set of individual sample (*see* C-3.1), composite sample (*see* C-3.2) and a set of samples for microbiological examination (*see* C-3.3) marked for this purpose and shall bear the seals of the purchaser and the vendor. These shall be kept at a place as agreed to between the purchaser and the vendor so as to be used in case of a dispute between the two.

C-4 NUMBER OF TESTS

C-4.1 Tests for the determination of moisture, total solids, insolubility index, total ash and fat shall be conducted on each of the samples consisting a set of the sample.

C-4.2 Tests for flavour, odour and titratable acidity shall be conducted on the composite sample.

C-4.3 Tests for bacteriological requirements shall be conducted, on each of the samples constituting a set of test samples labelled with the words 'For Microbiological Examination'.

C-5 CRITERIA FOR CONFORMITY

C-5.1 The lot shall be declared as conforming to all the requirements of the specification of C-5.1.1 and C-5.1.3 are satisfied.

C-5.1.1 The test results on each of the individual samples for determination of requirements given in C-4.1 shall satisfy the corresponding specification requirements.

C-5.1.2 The test results on the composite samples for flavour and odour and titratable acidity shall satisfy the corresponding specification requirements.

C-5.1.3 The test results for bacteriological specifications shall satisfy the corresponding requirements.

Table 2 Number of Containers to be Selected for Sampling

(*Clauses C-2.2 and C-3.3*)

For Containers of 500 g and Up to 5 kg			For Containers of More Than 5 kg		
Number of Containers in the Lot	Sample Size		Number of Containers in the Lot	Sample Size	
	For tests other than Micro-biological Tests	For Micro-biological Tests		For tests other than Micro-biological Tests	For Micro-biological Tests
(1)	(2)	(3)	(4)	(5)	(6)
Up to 100	3	1	Up to 50	2	1
101 to 300	5	2	51 to 100	3	1
301 to 500	7	3	101 to 300	4	2
501 and above	9	4	301 and above	5	3

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Amendments Issued Since Publication

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