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IS 1011 (2002): Biscuits [FAD 16: Foodgrains, Starches and Ready to Eat Foods]

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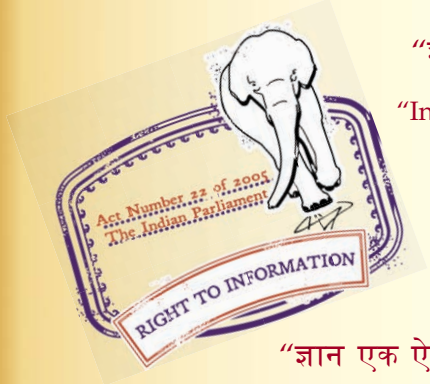

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IS 1011 : 2002
Reaffirmed 2009

भारतीय मानक

बिस्कुट — विशिष्टि

(चौथा पुनरीक्षण)

Indian Standard

BISCUITS — SPECIFICATION

(Fourth Revision)

ICS 67.060

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

October 2002

Price Group 4

AMENDMENT NO. 1 FEBRUARY 2006
TO
IS 1011 : 2002 BISCUITS — SPECIFICATION

(Fourth Revision)

(*Page* 2, *clause* **4.1.13**) — Insert the following new clause after **4.1.13**:

'**4.1.14** *Water* — Packaged drinking water (conforming to IS 14543) or drinking water (conforming to IS 10500).'

(*Page* 3, *clause* **5**) — Add the following after Type V:

"Type VI Salted biscuits"

(*Page* 3, *clause* **5.5.1**, *third line of Note*) — Add '(conforming to 10633)' and '(conforming to IS 10634)' after 'hydrogenated vegetable oil' and 'bakery shortening' respectively.

(*Page* 3, *clause* **5.5.2**) — Insert the following new clause after **5.5.2**:

'**5.6 Salted** — Salted biscuits are biscuits which are sprinkled with salt or spread with oil mixed with salt.'

(*Page* 5 *and* 6, *Annex* A) — Insert reference of the following Indian Standards at the appropriate place:

'IS No.	*Title*
10500 : 1992	Drinking water (*first revision*)
14543 : 2004	Packaged drinking water (other than packaged natural mineral water) (*first revision*)"

(*Page* 7, *clause* **D-2.2**) — Substitute '**0.1N**' *for* '**0.1M**'.

(*Page* 7, *clause* **D-2.4**, *line* 2) — Substitute '0.1N' *for* '0.1M'.

(*Page* 8, *clause* **D-4**) — Substitute constant factor '2.82' *for* '1.41'.

(*Page* 8, *clause* **D-4**) — Substitute '0.1N' *for* '0.1M'.

(FAD 16)

Reprography Unit, BIS, New Delhi, India

FOREWORD

This Indian Standard (Fourth Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Bakery, Confectionery and Nutritious Supplements Industries Sectional Committee had been approved by the Food and Agriculture Division Council.

The term 'Biscuit' covers a large variety of sweet, salted, filled and coated biscuits. It is difficult to classify biscuits based on chemical composition and processing methodologies due to overlap. However, varietal differences can be distinguished well by their sensory attributes.

This standard mainly lays down essential requirements to which biscuits of the different types should conform.

This standard was initially published in 1957 and subsequently revised in 1968, 1981 and 1992. In these revisions, the list of optional ingredients had been further expanded. Provision has also been made to ensure its freedom from harmful and injurious foreign matter, inclusion of flexible laminate for packaging, providing complaint legend on the packet containing codified date of manufacture of biscuits for use by consumer in case of complaint. In this revision, classification of biscuits based on sensory attributes has been brought into the text as type of biscuits (*see* **5**). The list of ingredients has been updated and regrouped.

There is a separate specification for wafer biscuits [*see* IS 2397 : 1988 'Wafers (*second revision*)'] which is not covered in this standard.

In the preparation of this standard, due consideration has been given to the *Prevention of Food Adulteration Act*, 1954 and the Rules framed thereunder. Due consideration has also been given to the *Standards of Weights and Measures (Packaged Commodities) Rules*, 1977. However, this standard is subject to the restrictions imposed under these Act and Rules, 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 of 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.

Indian Standard

BISCUITS — SPECIFICATION

(Fourth Revision)

1 SCOPE

This standard prescribes the requirements, methods of sampling and test for biscuits baked from dough containing essential ingredients (*see* **3**) with or without the addition of optional ingredients (*see* **4**).

2 REFERENCES

The Indian Standards listed in Annex A are necessary adjuncts to this standard.

3 ESSENTIAL INGREDIENTS

3.0 The following materials shall be used in the preparation of biscuit doughs.

3.1 *MAIDA* (*see* IS 7463) and/or Wheat *ATTA* (*see* IS 1155)

3.2 Fat or Shortening

Vanaspati (*see* IS 10633), bakery shortening (*see* IS 10634), refined edible vegetable oils, butter oil, butter, *Ghee*, margarine (*see* IS 12451) or their blends.

3.3 Sugar (*see* IS 498, IS 1151 and IS 1152)

3.4 Water (*see* IS 4251)

4 OPTIONAL INGREDIENTS

4.1 In addition to the essential ingredients specified under **3**, any of the following ingredients may be used in the preparation of biscuits.

4.1.1 *Cereals and Cereal Products*

Whole wheat meal

Wheat *ATTA* (*see* IS 1155)

Semolina (*SUJI* or *RAVA*) (*see* IS 1010)

Wheat bran, edible

Wheat germ

Maize germ

Barley powder (*see* IS 1157)

Oat flour, edible

BESAN flour (*see* IS 2400)

Rice flour

Malt flour

4.1.2 *Oil Seed Products*

Soya bean flour, full fat (*see* IS 7837), medium fat (*see* IS 7836) or solvent extracted low fat (*see* IS 7835)

Peanuts

Peanut butter (*see* IS 9037)

Edible groundnut flour, expeller pressed (*see* IS 4684) or solvent extracted (*see* IS 4875) High protein mixes for use as food supplement (*see* IS 3137). Other oil seed flours, protein isolates and concentrates.

4.1.3 *Edible Starches*

Tapioca flour, edible (*see* IS 1318)

Potato flour, edible (*see* IS 9130)

Sweet potato flour, edible

Arrowroot starch, edible (*see* IS 1006)

Maize starch, edible (*see* IS 1005)

Tapioca starch, edible (*see* IS 1319)

Rice starch, edible

Potato starch, edible

4.1.4 *Milk and Milk Products*

Casein, edible (*see* IS 1167)

Milk powder (*see* IS 1165)

Skimed milk powder [*see* IS 13334 (Parts 1 and 2)]

Butter milk and its solids

Liquid milk

Condensed milk (*see* IS 1166)

Cheese (*see* IS 2785)

Whey solids

Malted milk food (*see* IS 1806)

4.1.5 *Sugars*

Sugars (sucrose) (*see* IS 498, IS 1151 and IS 1152)

Liquid glucose (*see* IS 873)

Dextrose monohydrate (*see* IS 874)

Jaggery and *Khandsari*

Molasses (edible), cane (*see* IS 1162)

Lactose (*see* IS 1000)

Malt extract (*see* IS 2404)

Invert syrup

Golden syrup

Honey

4.1.6 *Fruit and Fruit Products*

Desiccated coconut (*see* IS 966)

Dry fruits

Edible nuts

Pectin

Fruit jams

4.1.7 *Spices and Condiments*

Ginger (*see* IS 1908)

Chilli powder (*see* IS 2322)

Black pepper (*see* IS 1798)

Saffron [*see* IS 5453 (Parts 1 and 2)]

Ajowan (*see* IS 4403)

Cardamom (*see* IS 1907)

Cumin (*see* IS 2447)

Other permitted spices

4.1.8 *Miscellaneous*

Coffee powder (*see* IS 3077)

Cocoa powder (*see* IS 1164)

Covering chocolate (*see* IS 1163)

Edible vegetables/Vegetable products

Soluble starch phosphate (*see* IS 10597)

Edible salt (conforming to IS 253 or IS 7224)

Caramel (*see* IS 4467)

Egg

4.1.9 *Food Processing Aids and Food Additives*

4.1.9.1 *Flavours, flavouring agents, flavour improvers and fixers,* as permitted under PFA Rules.

4.1.9.2 *Colouring matter and preservatives,* as permitted, under PFA Rules.

4.1.9.3 *Antioxidants, emulsifying and stabilizing agents,* as permitted under PFA Rules.

4.1.9.4 *Enzymes and gluten conditioners*

Proteolytic and amylases, sodium bisulphite and sodium metabisulphite.

4.1.9.5 *Flour improvers,* as permitted under PFA Rules.

4.1.10 *Leavening Agents*

Baking powder (*see* IS 1159)

Ammonium bicarbonate (*see* IS 2697)

Sodium bicarbonate (*see* IS 2124)

Ammonium carbonate (*see* IS 5316)

Active baker's yeast (*saccharomyces cerevisiae*) (*see* IS 1320)

Sodium acid pyrophosphate

Tartaric acid (*see* IS 9504)

Any other approved aerating agent

4.1.11 *Nutrients*

Vitamins

Protein concentrates

Calcium phosphate

Calcium diphosphate

Calcium triphosphate

Calcium carbonate

Ferrous sulphate

Ferrous fumerate

Lysine monohydrochloride

Gluten

Potassium iodide

L-cysteine

4.1.12 *Dough Conditioners*

Sodium sulphite

Sodium metabisulphite

4.1.13 *Mould Inhibitors*

Acetic acid (*see* IS 695) or lactic acid (*see* IS 9971)

Vinegar (*see* IS 14703)

5 TYPES OF BISCUITS

On the basis of sensory attributes, the different varieties

can be broadly classified as given below

Type I	Sweet
Type II	Semi-sweet
Type III	Crackers
Type IV	Cookies
Type V	Speciality biscuits

5.1 Sweet

This is the most common variety of biscuits where fat and sugar levels are generally high This variety in general provides a comparative shorter bite, sweet taste

5.2 Semi-sweet

Semi-sweet type of products have comparatively low level of sweetness, in general The product is harder in texture and generally low in fat content

5.3 Crackers

Crackers are biscuits which in general show a typical flaky inner layers These products can be fermented or non-fermented types, oil-dipped or not and they may or may not be sprinkled with salt

5.4 Cookies

Cookies are a group of products which are shortest in bite compared to general / common sweet varieties These may be further enriched by incorporation of nuts, dry fruits, chocolates, etc This product has a very high sugar and fat content as compared to the sweet variety

5.5 Speciality Biscuits

There are several other products termed as speciality biscuits which include different varieties of biscuits, such as filled biscuits or coated biscuits, cream sandwich biscuits. There are product possibilities in each of the types to be coated with chocolate

5.5.1 *Filled Biscuits*

Filled biscuits shall be biscuits sandwiched with a filling of either cream, jam, jelly, marshmallow, chocolates, caramel, figs, raisins, or the like with sweet type shells, semi-sweet type shells, cracker shells or even cookie type shells

NOTE — For the purpose of this standard 'cream' means basically a homogeneous preparation of hydrogenated vegetable oil or bakery shortening, icing sugar, pulverized sugar, permitted flavours and permitted food colours with or without other ingredients in small proportions

5.5.2 *Coated Biscuits*

Coated biscuits shall be biscuits as such or with filling in between (*see* **5.5.1**), but coated with chocolate or caramel or other suitable enrobing materials This group will also include products with whole meal

6 REQUIREMENTS

6.1 General Requirements

The biscuits shall be properly baked so that they are crisp and have uniform texture and appearance The design, if any on the biscuits should be clear They shall have an agreeable flavour typical of well-baked biscuits of different types and shall be free from any soapy or bitter after-taste The biscuits shall be free from fungus and insect infestation, rancid taste and odour The biscuits shall also be free from any harmful or injurious foreign matter

NOTE — The appearance, taste odour and rancid flavours shall be determined by organoleptic tests

6.2 Biscuits shall be manufactured under hygienic conditions (*see* IS 5059)

6.3 Biscuits shall also comply with the requirements given in Table 1

Table 1 Requirements for Biscuits

Sl No	Characteristic	Requirement	Method of Test, Ref to Annex
(1)	(2)	(3)	(4)
i)	Moisture, percent by mass, *Max*	5 0	B
ii)	Acid insoluble ash (on dry basis) percent by mass, *Max*	0 05	C
iii)	Acidity of extracted fat (as oleic acid), percent by mass, *Max*	1 2	D

7 PACKING AND MARKING

7.1 Packing

Biscuits shall be packed in clean, sound containers made of tin plate, PCRC sheets, cardboard, paper or other material agreed upon between the purchaser and the vendor, in such a way as to protect them from breakage, contamination, absorption of moisture and seepage of fat from the biscuits into the packing materials and should not impart any objectionable odour and taste to the biscuits The biscuits shall not come in direct contact with the packaging materials other than grease proof or sulphite paper, cellulose film, aluminium foil laminates (*see* IS 8970), food grade plastics conforming to the relevant Indian Standard or any other non-toxic packing material which may be covered with a moisture-proof film, waxed paper (*see* IS 9988) or moisture-proof laminates, the inner

layer coming in contact with the biscuits shall be of food-grade quality, or coated paper. The biscuits in tins should not come into direct contact with unlacquered metal walls.

7.1.1 In the case of packets weighing 150 g and above, a complaint slip/legend giving batch or the code number shall be included in the container or printed on container/labels.

7.2 Marking

The following particulars shall be clearly and indelibly marked on the label of each container/packet:

a) Name of the product;

b) Trade name, if any;

c) Name and address of the manufacturer;

d) Batch or code number;

e) Net mass in grams or kilograms;

f) List of ingredients, in descending order of their composition by mass;

g) The statement with respect to addition of permitted colours and flavours;

h) Month and year of manufacture;

j) The words 'Best before .....' (month and year to be indicated); and

k) Any other requirements as specified under the *Standards of Weights and Measures (Packaged Commodities) Rules*, 1977 and the *Prevention of Food Adulteration Act*, 1954.

7.2.1 *BIS Certification Marking*

The product may also be marked with the Standard Mark.

7.2.1.1 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 the conditions under which the licence for the use of Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

8 SAMPLING

The method of drawing the representative samples of the biscuits and the criteria for conformity shall be as prescribed in **3** and **5** of IS 12741.

ANNEX A

(*Clause* 2)

LIST OF REFERRED INDIAN STANDARDS

IS No	*Title*
253 1985	Edible common salt (*third revision*)
498 1985	Grading for vacuum pan sugar (plantation white) (*fourth revision*)
695 1986	Acetic acid (*third revision*)
873 1974	Liquid glucose (*first revision*)
874 1975	Dextrose monohydrate (*second revision*)
966 1999	Desiccated coconut (*second revision*)
1000 1989	Lactose, commercial (*first revision*)
1005 1992	Edible maize starch (corn flour) (*third revision*)
1006 1984	Arrowroot starch (*second revision*)
1010 1968	*SUJI* or *RAWA* (semolina) (*first revision*)
1070 1992	Reagent grade water — Specification (*first revision*)
1151 1969	Refined sugar (*first revision*)
1152 1976	Icing sugar (*first revision*)
1155 1968	Wheat *ATTA* (*second revision*)
1157 1957	Barley powder
1159 1981	Baking powder (*first revision*)
1162 1958	Cane molasses
1163 1992	Chocolates (*second revision*)
1164 1986	Cocoa powder (*third revision*)
1165 1992	Milk powder (*fourth revision*)
1166 1986	Condensed milk, partly skimmed and skimmed condensed milk (*second revision*)
1167 1965	Casein (edible quality) (*revised*)
1318 1969	Edible tapioca flour (*first revision*)
1319 1983	Edible tapioca starch (*second revision*)
1320 1988	Baker's yeast (*third revision*)
1798 1982	Black pepper, whole and ground (*first revision*)
1806 1975	Malted milk foods (*first revision*)
1907 1984	Cardamom (capsules and seeds) (*second revision*)
1908 1993	Ginger, whole and ground (*second revision*)
2124 1974	Sodium bicarbonate (*first revision*)
2322 1998	Chillies, whole and ground (*second revision*)
2400 1976	*BESAN* (*first revision*)
2404 1993	Malt extract (*second revision*)
2447 1993	Cumin, whole (*second revision*)
2697 1976	Ammonium bicarbonate for food industry (*first revision*)
2785 1979	Natural cheese (hard variety), processed cheese, processed cheese spread and soft cheese (*first revision*)
3077 1992	Roasted and ground coffee (*second revision*)
3137 1974	High-protein mixes for use as food supplement (*first revision*)
4251 1967	Quality tolerances for water for processed food industry
4403 1979	*AJOWAN* (*first revision*)
4467 1996	Caramel (*second revision*)
4684 1975	Edible groundnut flour (expeller pressed) (*first revision*)
4875 1986	Edible groundnut flour (solvent extracted) (*first revision*)
5059 1969	Code for hygienic conditions for large scale biscuit manufacturing units and bakery units
5316 1998	Ammonium carbonate (*first revision*)

IS No.	*Title*
5453	Saffron
(Part 1) : 1996	Specification
(Part 2) : 1996	Method of test
7224 : 1985	Iodized salt (*first revision*)
7463 : 1988	Wheat flour (*MAIDA*) for use by biscuit industry (*first revision*)
7835 : 1975	Edible medium fat soya flour
7836 : 1975	Edible low-fat soya flour
7837 : 1975	Edible full-fat soya flour
8970 : 1991	Aluminium foil laminates for packaging of food and pharmaceuticals (*first revision*)
9037 : 1979	Peanut butter
9130 : 1979	Edible spray dried potato flour
9504 : 1980	L (+) — Tartaric acid food grade
9971 : 1981	Lactic acid, food grade
9988 : 1981	Waxed paper for bread and biscuits
10597 : 1983	Soluble starch phosphate (edible grade)
10633 : 1999	Vanaspati (*second revision*)
10634 : 1986	Bakery shortening (*first revision*)
12451 : 1988	Margarine
12741 : 1989	Bakery products — Sampling
13334	Skim milk powder
(Part 1) : 1998	Standard grade
(Part 2) : 1992	Extra grade
14703 : 1999	Vinegar — Specification

ANNEX B

[*Table* 1, *Item* (i)]

DETERMINATION OF MOISTURE

B-0 Two methods for the determination of moisture content in biscuits have been given. Method I, namely, the moisture meter method may be used as a routine method after calibrating it with the oven method given under Method II.

B-1 METHOD I

This method involves the use of electrical moisture meters for rapid estimation of moisture in the biscuit samples. Various moisture meters are available. The conversion tables for their use are available with the equipment, but the instruments shall be calibrated under the conditions of actual use in comparison with the oven method given under Method II.

B-2 METHOD II

B-2.1 Apparatus

B-2.1.1 *Moisture Dish*, made of procelain, silica, glass or aluminium.

B-2.1.2 *Oven, Electric*, maintained at 105 ± 1°C.

B-2.1.3 *Desiccator*

B-2.2 Procedure

Weigh accurately about 5 g of the prepared sample in the moisture dish, previously dried in the oven and weighed. Place the dish in the oven maintained at 105 ± 1°C for 4 h. Cool in the desiccator and weigh. Repeat the process of drying, cooling and weighing at 30 min interval until the difference between the two consecutive weighings is less than one milligram. Record the lowest mass.

B-2.3 Calculation

$$\text{Moisture, percent by mass} = \frac{100\,(M_1 - M_2)}{M_1 - M}$$

where

M = mass, in g, of the empty dish;

M_1 = mass, in g, of the dish with the material before drying; and

M_2 = mass, in g, of the dish with the material after drying to constant mass.

ANNEX C

[*Table* 1, *Item* (ii)]

DETERMINATION OF ACID INSOLUBLE ASH

C-1 APPARATUS

C-1.1 Dish — silica or porcelain.

C-1.2 Muffle Furnace — maintained at 600 ± 20°C.

C-1.3 Water-Bath

C-1.4 Desiccator

C-2 REAGENT

C-2.1 Dilute Hydrochloric Acid — approximately 5 N, prepared from concentrated hydrochloric acid.

C-3 PROCEDURE

Weigh accurately about 20 g of biscuit powder in the dish and ash in the muffle furnace at 600 ± 20°C until light grey ash is obtained. Remove the dish from the furnace and allow it to cool at room temperature. Add 25 ml of the hydrochloric acid to the dish, cover with a watch-glass and heat on the water-bath for 10 min. Mix the contents with the tip of a glass rod and filter through Whatman filter paper No. 42 or its equivalent. Wash the filter paper with water until the washings are free from acid when tested with a blue litmus paper. Return the washed filter paper to the dish for ashing in the muffle furnace as above. Cool the dish in a desiccator and weigh. Again ignite the dish for half an hour in the furnace, cool and weigh. Repeat this operation until the difference between successive weighings is less than 1 mg. Filter 25 ml of the hydrochloric acid through a blank filter paper, wash, ash and weigh it as in the case of acid insoluble ash. Subtract its mass from the mass of insoluble ash of the sample.

C-4 CALCULATION

C-4.1 Acid insoluble ash,

$$\text{percent by mass} = \frac{100\,(M_1 - M)}{M_2}$$

where

M = mass, in g, of the empty dish in which the sample is taken for ashing;

M_1 = mass, in g, of the dish containing acid insoluble ash (*see* Note); and

M_2 = mass, in g, of the sample.

NOTE — Correct the acid insoluble ash mass for the blank of filter paper, if any.

C-4.2 Acid insoluble ash,

$$\text{percent by mass (on dry basis)} = \frac{A \times 100}{100 - M}$$

where

A = acid insoluble ash, percent by mass (*see* **C-4.1**); and

M = percentage of moisture in the biscuit (*see* **B-2.3**).

ANNEX D

[*Table* 1, *Item* (iii)]

DETERMINATION OF ACIDITY OF EXTRACTED FAT

D-1 APPARATUS

D-1.1 Soxhlet Apparatus — with a 250-ml flat bottom flask.

D-2 REAGENTS

D-2.1 Phenolphthalein Reagent [1.0 Percent in Ethanol (95 Percent)]

D-2.2 0.1 M Potassium Hydroxide Solution

D-2.3 Ether-Ethanol (95 Percent) Stock Solution

D-2.4 Petroleum Ether (Boiling Point 40-80°C)

Equal volumes of ethanol-ether which has been neutralized to phenolphthalein with 0.1 M potassium hydroxide.

D-3 PROCEDURE

D-3.1 Weigh accurately a mass of biscuit powder containing more than 3.0 g of fat and transfer it to the thimble and plug it from the top with extracted cotton and filter paper.

NOTE — In case of filled and coated biscuits, the mass of the biscuits includes the filled and coated material also.

D-3.2 Dry the thimble with the contents for 15 to 30 min at 100°C in an oven. Extract the fat with petroleum ether (*see* **D-2.4**) in the Soxhlet apparatus for 3 to 4 h and evaporate off the solvent in the flask on a water-bath. Remove the traces of the residual solvent by keeping the flask in the hot air oven for about half an hour. Cool the flask. Weigh accurately about 3.0 g (M) of extracted fat in a tared 250 ml flat-bottomed flask and add 50 ml of mixture of equal volume of alcohol and ethanol (*see* **D-2.3**). If the test specimen does not dissolve in the cold connect the flask with a suitable condensor and warm slowly with frequent shaking, until the specimen dissolves. Add 1 ml of phenolphthalein reagent (*see* **D-2.1**) and titrate the contents to a distinct pink colour with the potassium hydroxide solution taken in a 10-ml microburette. If the contents of flask become cloudy, during titration, add another 50 ml of the reagent (*see* **D-2.1**) and continue titration. Make a blank titration of the 50 ml reagent. Subtract from the titre of the fat, the blank titre.

D-4 CALCULATION

Acidity of extracted

fat (as oleic acid), percent by mass = $\frac{1.41 \times V}{M}$

where

V = volume of 0.1 M potassium hydroxide solution used in titration after subtracting the blank; and

M = mass, in g, of extracted fat taken for the titration.

Bureau of Indian Standards

BIS is a statutory institution established under the *Bureau of Indian Standards Act,* 1986 to promote harmonious development of the activities of standardization, marking and quality certification of goods and attending to connected matters in the country.

Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Catalogue' and 'Standards : Monthly Additions'.

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Amendments Issued Since Publication

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