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PAKISTAN STANDARD

SPECIFICATION FOR BISCUITS (EXCLUDING WAFER BISCUITS) (1ST REVISION)



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PAKISTAN STANDARDS INSTITUTION,
39 – Garden Road, Saddar,
Karachi-74400.

PS:383 – 1980
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FOR
WAFER (EXCLUDING WAFER BISCUITS)
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**PAKISTAN STANDARD SPECIFICATION
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0. FOREWORD

0.1 This revised Pakistan Standard was adopted by the Pakistan Standards Institution on 28th May, 1980 on the endorsement by the Chemical Divisional Council of the draft finalized on 16th December, 1979 by the cereals, pulses and their products Sectional Committee.

0.2 The term 'Biscuit' covers a large variety of sweet, salted, filled and coated biscuits. This standard mainly lays down essential requirements to which biscuits of different varieties should conform. The Sectional Committee, while preparing the previous version of this standard, had made an on-the-spot study of the methods of manufacture of various types of biscuits in the country. The Committee also gave due weightage to the need for co-ordination between standards laid down by the Ministry of Defence for their purchases against Defence requirements, other Government and non-governmental agencies and standards in vogue in certain countries abroad.

0.3 PS:383 – 1964 has been revised to enlarge its scope to cover filled as well as coated biscuits. List of ingredients used for the manufacture of biscuits has been considerably expanded to include all materials being used at present. Besides the methods of test have been modified to expedite the test procedures.

0.4 The quantities appearing in this standard have been expressed in rounded off values in SI units.

0.5 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 PS 103:160. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard prescribes the essential requirements, methods of sampling and test for biscuits baked from dough containing essential materials (see 2) with or without the addition of their ingredients (see 3).

2. ESSENTIAL MATERIALS

2.0 The following materials shall be used in the preparation of biscuit dough.

2.1 MAIDA – Conforming to High Gluten (HG) or Medium Gluten (MG) Grades of PS:381-1964.

2.2 FAT OR SHORTENING – hydrogenated edible vegetable oil, bakery shortening, refined edible vegetable oilbutter, butter oil (ghee) or margarine.

2.3 WATER – Water potable.

2.4 Edible common salt (five types) see PS:14-1959.

3. OTHER INGREDIENTS

3.1 In addition to the essential ingredients specified under 2 any of the following ingredients may be used in the preparation of biscuits.

3.1.1 Cereals and cereals products

whole wheat meal

Wheat Atta (See (PS:380-1964).

Semolina (SUJI OR RAVA (see PS:190-1962)

Barley Powder (see PS: 192-1962)

Oat flour, edible

BESAN flour

Rice flour

Malt flour

3.1.2 Oil Seed Products

Soyabean flour (full fat or solvent extracted)

Pea nuts butter

Edible groundnut flour, expeller pressed (see PS:223-1962)

or solvent extracted

Edible cotton seed flour

Pakistan multipurpose food flour

3.1.3 Edible Starches

Topioca flour, edible

Potato flour, edible

Sweet-potato flour, edible (PS:547-1964)

Arrowroot starch, edible (PS:370-1963)

Maize starch, edible

Tapioca starch, edible

Rice starch.

3.1.4 Milk and Milk Products

Casein, edible (PS:758-1969)

Milk powder (whole and skim (see PS:363-1963)

Butter milk and its solids

Liquid milk

Condensed milk (see 364-1963)

Cheese

Whey solid

Malted milk food.

3.1.5 Sugars (see PS:362-1963)

Sugar (sucrose) (see PS:138-1962)

Liquid glucose (see PS:147-1961)

Dextrose monohydrate (see PS:140-1961)

Jaggery and khandsari

Molasses (edible), cane (PS:139-1961)

Lactose

Malt extract

Invert syrup

Golden syrup

Honey

3.1.6 Fruit and Fruit Product

Desicated coconut

Dry Fruits

Edible nuts

Pectin

Jam (see PS:519-1964).

3.1.7. Spicos

Ginger

Chilli powder

Black pepper

Saffron

Ajowan

Cardamon

Cumin

Other permitted spices

3.1.8 Miscellaneous

Coffee powder (PS:763-1969)

Cocoa-powder

Covering chocolate (PS:736-1968)

Edible vegetables.

3.1.9. Enzymes and Gluten Conditioners – preteolytic and amylases, sodium bisulphate and sodium metabisulphite.

3.1.10. Food additives.

3.1.10.1. Flavour-Flavouring essences, improvers and fixer

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- 3.1.10.2 Colouring matter – only permitted colours be used.
- 3.1.10.3 Antioxidants – tartaric acid and citric acid.
- 3.1.10.4. Emulsifying agents – such as lecithin and glycerol monostearate.
- 3.1.11. Leavening Agents.

Baking powder (see PS:657-1968)

Ammonium bicarbonate

Sodium bicarbonate

Ammonium carbonate (BP)

Active baker's yeast (*Saccharomyces cerevisiae*)

Any other approved aerating agent.

3.2.12.Nutrients

Vitamins

Calcium phosphate

Calcium diphosphate

Calcium triphosphate

Calcium carbonate

Lysine monohydrochloride

Protein concentrates

4. REQUIREMENTS :

4.1 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.

Note : - For the purpose of this standard, 'cream' means a homogenous mixed preparation of hydrogenated fat, or bakery shortening icing sugar, flavours and permitted food colours with or without other ingredients in small proportions.

4.1.1 Filled Biscuits – Filled biscuits shall be biscuits sandwiched with a filling of either cream, jam jelly, marshmallow, caramel, chocolate cocoa powder dry fruit, cheese, and other ingredients of nutritional value, or the like.

4.1.2. Coated Biscuits – Coated biscuits shall be biscuits as such or with the filling in between but coated with chocolate or caramel or cocoa and cocoa cream or the like.

4.2. Biscuits shall be manufactured under hygienic conditions.

4.3. Biscuits shall also comply with the requirements given in Table I.

TABLE I. – REQUIREMENTS FOR BISCUITS

| Sl: No. | Characteristic | Requirement | Method of (ref to appendix) |
|----------------|--|--------------------|------------------------------------|
| 1 | 2 | 3 | 4 |
| (i) | Moisture, percent by weight, Max. | 5.5 | B |
| (ii) | Acid insoluble ash (on dry basis), percent by weight, Max. | 0.05 | C |
| (iii) | Acidity of extracted fat (as oleic acid), percent by weight, Max | 1.0 | D |

5. PACKING AND MARKING :

5.1 Packing – Biscuits shall be packed in clean, sound containers, made to tinplate, 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. The biscuits shall not come in direct contact with the packing materials other than greese-proof or sulphite paper, cellulose film or any other non-toxic packing material which may be covered with a moisture-proof film, waxed paper or moisture-proof laminates or coated paper. The biscuits in tins should not come in direct contact with the metal walls.

5.2 Marking – The following particulars shall be clearly and indelibly marked on label on each container :

- (a) Name or trade-name of the biscuit,
- (b) Name of the biscuit manufacturer,
- (c) Batch or code number,
- (d) Net weight in grams (g) or kilograms (kg), and
- (e) The statement ‘Permitted flavouring and colouring agents used’.

Note – Packets containing less than 60g of biscuits may not be marked with the particulars mentioned under 5.2. But packets having more than 60g and less than 120 g of biscuits shall be marked as required under 5.2 (a), (b) and (e) and may not be marked with particulars required under 5.2 (c) and (d).

5.2.1 Each pack of biscuits may also be marked with the PSI Certification Mark.

6. SAMPLING :

6.1 The method of drawing representative samples of the biscuits and the criteria for conformity shall be as prescribed in Appendix D.

7. TEST :

7.1 Tests shall be carried out as prescribed under 4.1 and in the appropriate appendices specified in col.4 of the Table I.

7.2 Quality of Reagents – Unless specified otherwise, pure chemicals of laboratory analytical grade shall be employed in tests and distilled water shall be used in the analysis and in the preparation of reagents.

Note – ‘Pure chemicals’ shall mean chemicals that do not impurities which affect the results of analysis.

APPENDIX A

[Table I, Item (i)]

DETERMINATION OF MOISTURE

A-1. APPARATUS :

A-1.1 Moisture Dish – made of porcelain, silica, glass or aluminium.

A-1.2 Oven – Electric, maintained at $105^0 \pm 1^0$ C.

A-1.3 Desiccator.

A-2. PROCEDURE :

A-2.1 Weigh accurately about 5g of the prepared sample (see D-3.3.3.) in the moisture dish, previously dried in the oven and weighed. Place the dish in the oven maintained at 104 ± 1^0 C for 4 hours. Cool in the desiccator and weigh. Repeat the process of drying, cooling and weighing at 30-minute intervals until the difference between the two consecutive weighing is less than one milligram. Record the lowest weight.

A-3. CALCULATION :

A-3.1 Moisture, percent by weight $\frac{100 (W_1 - W_2)}{W_1 - W}$

Where

W_1 = weight in g of the dish with the material

W_2 = weight in g of the dish with the material after drying to constant weight, and

W = weight in g of the empty dish

APPENDIX-B

[Table I, Item (ii)]

DETERMINATION OF ACID INSOLUBLE ASH

B-1 APPARATUS :

B-1.1 Dish – Silica or porcelain

B-1.2 Muffle Furnace – maintained at $600^\circ \pm 20^\circ\text{C}$

B-1.3 Water Bath

B-1.4 Desiccator

B-2. REAGENT :

B-2.1 Dilute Hydrochloric Acid – approximately 5N prepared from concentrated hydrochloric acid.

B-3. PROCEDURE :

B-3.1 Weigh accurately about 30g of the biscuit powder (D-3.3.2) in the dish and ash in the muffle furnace at $600^\circ \pm 20^\circ\text{C}$ 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 minutes. 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 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. Repeat this operation until the dish has a constant weight, the difference between successive weighing being less than 1mg. Filter 25 ml of the hydrochloric acid through blank filter paper, wash, ash and weigh it as in the case of acid insoluble ash. Subtract its weight from the weight of insoluble ash of the sample.

B-4. CALCULATION :

B-4.1 Acid insoluble ash, percent by weight

$$(A) = \frac{100 - (W_1 - W)}{W_2}$$

Where

W_1 = weight in g of the dish containing acid insoluble ash (see Note)

W_1 = weight in g of empty dish in which the sample is taken for ashing, and

W_2 = weight in g of the sample

Note – Correct the acid insoluble ash weight for the blank of filter paper, if any.

B-4.2 Acid insoluble ash, percent by weight (dry basis) $\frac{A \times 100}{100 - M}$

where

A = acid insoluble ash, percent by weight (B-4.1); and

M = percentage of moisture in the biscuit (A-3.1)

APPENDIX C

[Table I, Item (iii)]

DETERMINATION OF ACIDITY OF EXTRACTED FAT

C-1. APPARATUS :

C-1.1 Soxhlet Apparatus – With a 250-ml flat bottom flask

C-2 REAGENTS –

C-2.1 Petroleum Ether – boiling point 40° to 80°C.

C-2.2 Benzene – Alcohol – Phenolphthalein Stock Solution – to one litre of distilled benzene add one litre of alcohol or rectified spirit and 0.4 g of phenolphthalein. Mix the contents well.

C-2.3 Standard Potassium Hydroxide Solution – 0.05N

C-3. PROCEDURE :

C-3.1 Weight accurately about 10 g of biscuit powder D3.3.2 and transfer it to the thimble and plug it from the top with extracted cotton and filter paper. Dry the thimble with the contents for 15 to 30 minutes at 100°C in an oven. Take the weight of empty dry soxhlet flask. Extract the fat in the Soxhlet apparatus for 3 to 4 hours and evaporate of 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 and weigh. Cool the flask and add 50 ml of mixed benzene-alcohol-phenolphthalein reagent (C-2.2) and titrate the contents to a distinct pink colour with the potassium hydroxide solution taken in a 10 ml microburette. If the contents of the flask become cloudy, during titration, add another 50 ml of the reagent (C-2.2) and continue titration. Make a blank titration of the 50 ml reagent. Subtract from the titre of the fat, the blank titre.

C-4. CALCULATION :

C-4.1 Acidity of extracted fat (as oleic acid),
percent by weight

$$\frac{= 1.41 \times V}{W_1 - W}$$

where

V = volume of 0.05 N Potassium hydroxide solution used in titration after subtracting the blank.

W₁ = weight in g of Soxhlet flask containing fat, and

W = weight in g of empty Soxhlet flask.

APPENDIX-D

(Clause 6.1)

SAMPLING OF BISCUITS

D-1. GENERAL REQUIREMENTS OF SAMPLING :

D-1.0 In drawing, preparing, storing and handling samples, the following precautions and directions shall be observed.

D-1.1 Samples shall be taken in a protected place not exposed to damp air, dust or soot.

D-1.2 Precautions shall be taken to protect the samples, the lots being sampled, the sampling instrument and the containers for samples from adventitious contamination.

D-1.3 Loose biscuit samples, or the representative small packs, shall be placed in air-tight, dean and dry glass tin or aluminium containers of appropriate size.

D-1.4 The samples shall be stored at room temperature.

D-1.5 Each container containing the samples shall be sealed air-tight and marked with full details of sampling, such as date and time of sampling, batch or code number, name of the manufacturer, and other relevant particulars.

D-2. SCALE OF SAMPLING :

D-2.1 Lot – All the biscuit containers in a single consignment drawn from the same batch of manufacture shall constitute a lot. If the consignment is declared to consist of different batches of manufacture, the batches shall be marked separately and groups of containers in each batch shall constitute separate lots.

D-2.1.1 Samples shall be tested for ascertaining the conformity of the biscuits to the requirements of the specification.

D-2.2 The number of containers to be sampled from each lot shall depend on the size of the lot and be in accordance with Table 2.

D-2.3 The containers shall be selected at random from each lot and for this purpose, random number tables shall be used. In case such tables are not available, the following procedure shall be adopted.

Starting from any container, count them as 1,2,3,.....up to r and so on in one order, where r is equal to the integral part of the value N/n , being the total number of containers in the lot and n the number of containers to be selected (see Table 2). Every rth container thus counted shall be separated until the required number of containers is obtained from the lot.

TABLE : NUMBER OF CONTAINERS TO BE SELECTED FOR SAMPLING

(Clauses D-2.2 and D-2.3)

| LOT SIZE | SAMPLE SIZE |
|-----------------|--------------------|
| N | N |
| (1) | (2) |
| Up to 50 | 2 |
| 51 ” 150 | 3 |
| 151 ” 300 | 4 |
| 301 ” 500 | 5 |
| 500 and above | 7 |

D-3. TEST SAMPLES AND REFEREE SAMPLES :

D-3.1 Draw from each selected container, required number of biscuits packs. These packs shall be opened and mixed. If the container is packed with loose biscuits, sample of required quantity shall be taken from different parts of the selected container.

D-3.2 Preparation of Individual sample from the selected containers about 600 g. of biscuits shall be taken from different parts of the container. From this about 300 g. of the biscuits shall be taken from testing general requirements. This 300 g. of biscuits shall be divided into 3 equal parts, one for the purchaser, another for the vendor and the third for the referee. These biscuits shall be packed in air-tight, dry containers and labeled with particulars as given D-1.5.

D-3.3 Preparation of Composite Sample.

D-3.3.1 The composite sample shall be prepared from the remaining 300 g. of biscuit from each selected container, after the sample for general requirement is taken out as given in D-3. 3.1.1 to D-3.3.1.3.

D-3.3.1.1 Plain biscuits – Grind the sample as quickly as possible.

D.3.3.1.2 Filled biscuits – The cream, caramel, chocolate marshmallow, jam, jelly, or any other filling between biscuits should be removed by gentle scraping, before powdering the sample.

D-3.3.1.3 Coated and filled biscuits – As far as possible, the coating and the fillings should be removed before powdering the biscuits.

Note :-The biscuits are highly hygroscopic and take up moisture quickly when exposed to atmosphere. The preparation of sample should be done very quickly, preferably in a dry place.

D-3.3.2 A small but approximately equal quantity of the material (see D-3.3.1) shall be taken from the powdered sample of each selected container and mixed thoroughly so as to form a composite sample weighing not less than 200 g. This sample shall be divided approximately into three equal parts one for the purchaser, another for the vendor and the third for the referee. These parts shall be transferred immediately to clean, air-tight and dry containers which are then sealed air-tight and labelled with particulars as given in D-1.5.

D-3.3.3. The remaining portions of the powdered sample from each selected container (after a small quantity needed for the formation of the composite sample has been taken out) shall be divided into approximately three equal parts. These parts shall be transferred to clean, dry and air-tight containers which are then sealed with all the particulars as given in D-1.5, The sample in each such sealed container shall constitute an individual test sample. These individual samples shall be separated into three identical sets of test samples in such as way that each set a sample representing each selected container (see Table 2). One of these sets shall be marked for the purchaser, another for the vendor and the third for the referee.

D-3.4 Referee Sample – Referee samples shall consist of a set of individual biscuit samples (see D-3.2) marked for general requirements, test sample (see D-3.3) and a set of individual test samples (see D-3.3.3.3) and shall bear the seals of the purchaser and the vendor. These shall be kept at a place agreed to between the two.

D-4. NUMBER OF TESTS :

D-4.1 This biscuits selected according to D-3.2 shall be tested for general requirements.

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D-4.2 Test for moisture shall be conducted individually on each of the samples constituting a set of individual test samples (see D-3.3.3.)

D-4.3 Test for the determination of acid insoluble ash and acidity of extracted fat shall be conducted on the composite sample (see D-3.3.2)

D-5. CRITERIA FOR CONFORMITY

D-5.1 A lot shall be declared as conforming to the requirements of the specification for biscuits when the criteria given in D-5.1.3 are satisfied.

D-5.1.1 In case of general requirements, the biscuits shall satisfy the requirements as given in 4.1.

D-5.1.2 In case of moisture each of the test results as obtained from the individual test samples (see D-4.2) shall be less than or equal to 5.5 percent (see Table 1).

D-5.1.3 For acid insoluble ash and acidity of extracted fat, the test results obtained from the composite sample (see D-4.3) shall be less than or equal to 0.05 percent and 1.0 percent respectively (see Table I).

