Bangladesh Standard
Specification For
Wafer Biscuits
(*Draft for* Second Revision)

ICS 67.060

BANGLADESH STANDARDS AND TESTING INSTITUTION
MINISTRY OF INDUSTRIES
MAAN BHABAN, 116-A, TEJGAON INDUSTRIAL AREA
DHAKA-1208, BANGLADESH

BSTI

Foreword

This Bangladesh Standard was adopted by the Bangladesh Standards and Testing Institution on ……., after the draft finalized by the Bakery and Confectionary Products Sectional Committee had been approved by the Agricultural and Food Products Divisional Committee.

The demands for production of Wafer biscuits and for wafers suitable for serving with ice-cream are gradually on the increase. In the manufacture of wafers, the consistency and composition of the batter mixing time, baking time and temperature are of considerable importance.

This standard was formulated in 1982 and then firstly revised in 2010. Keeping in view the latest technological and trade advances the committee felt it to revise in the light of latest development in the Industries. Major modifications in this version are as follows:

a) the types of wafer biscuits have been updated;
b) the ingredient lists for wafer biscuits have been modified;
c) clauses for 'hygienic requirements' and 'legal requirements' have been included;
d) microbiological and heavy metal limits have been introduced; and
e) requirements for labeling has been modified according to the current practice.

The Sectional Committee responsible for the preparation of this standard has taken into consideration the views of the members of this committee, manufacturers, consumers and technologists. This standard is subject to periodical reviews and amendments, if necessary. Any suggestions for improvement will be recorded and placed before the Committee in due course.

In the formulation of this standard, considerable assistance has been derived from the following publications, which are acknowledged with thanks.

IS 2397:1988 Wafer Biscuits (Second Revision), Amendment 1:1992 (Reaffirmed-2020)
Bureau of Indian Standards

PS 614:2011 Wafer Biscuits (Third Revision)
Pakistan Standards and Quality Control Authority

This standard BDS 1001:YYYY Wafer biscuits (2nd Rev.) cancels and BDS 1001:2010 Wafer biscuits (1st Rev.) that has been technically revised.

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(Second Revision)

1. Scope

1.1 This standard prescribes the essential requirements and the methods of test for wafer biscuits.

2. Normative References

2.1 The Bangladesh Standards listed in Annex-A are necessary adjuncts to this standard. For references, the latest edition of the referenced document including any amendments applies.

3. Terminology and Types

For the purpose of this standard the following definitions apply:

3.1 Wafer biscuits- These are thin, light, crisp, sweet cookie or cracker, especially one of a kind that may be eaten with ice cream. Wafer biscuits shall be of any of the following three types:

3.1.1 Plain wafers - Plain wafers may be hollow or flat or cone on in any shape desired by the purchaser.

3.1.2 Sandwiched wafers - Sandwiched wafers shall have two or more plain wafers, sandwiched with filling in between. The filling may be cream, jam, jelly, caramel, dry fruits, chocolate, cocoa, cheese, spices and other ingredients and shall be not less than 20 percent by mass of the filled wafer.

3.1.3 Coated wafers- These include both half-coated and full-coated wafers. The coating may be of chocolate, substitute fats butter scotch and the like and shall not be less than 60 percent by mass of the coated wafers.

NOTE– For the purpose of this standard, “cream” means a homogenous mixed preparation of hydrogenated fat, or bakery shortening, icing sugar, flavors and permitted colours with or without other ingredients in small proportion.

4. Ingredients

4.1 All ingredients shall conform to the relevant Bangladesh Standard specifications if available or permitted by national legislations. All materials shall be food grade, halal and free from foreign matter, harmful microorganisms, insect infestation, objectionable flavours and odours and processing aids.

4.2 Essential ingredients –

a) Wheat Flour
b) Water

4.3 Optional ingredients

i. Sugar or sugar products
ii. Fat or shortening-hydrogenated edible vegetable oil, bakery shortening butter, margarine, butter oil, or their mixture;
iii. Edible common salt
iv. Baking powder or other approved aerating/leavening agents;
v. Milk and Milk products, such as butter, milk powder, cheese, milk powder, condensed milk, edible casein
vi. Edible flours/starches
vii. Dessicated coconut

viii. Fruit and fruit products;
ix. Edible vegetable products;
x. Malt products
xi. Honey;
xii. Cereals and cereal products;
xiii. Chocolates;
xiv. Cocoa powders;
xv. Coffee extract;
xvi. Spices, condiments and their extracts
xvii. Yeast;
xviii. Eggs
xix. Jellifying agent;
xx. Vitamins/minerals;
xxi. Citric acid, malic acid, lactic acid and tartaric acid;
xxii. Ascorbic acid;
xxiii. Enzymes
xxiv. Flavour improvers and fixers;
xxv. Flour improvers;
xxvi. Gluten.

4.3.1 In the preparation of wafer biscuits, the addition of flavourings, colourings, preservatives, stabilizers, emulsifiers, required shall be according to the relevant category of the updated version of CXS 192 or permitted by national legislations.

5. Requirements

5.1 Wafer biscuits shall be suitably baked and shall not show signs of under baking or over baking. They shall be crispy, crunchy and light in texture. The design impressed on them, if any, shall be clear. They shall have an agreeable odour typical of well baked wafer biscuits and shall be free from soapy or other objectionable tastes, insect and fungus infestation. They shall also be free of harmful foreign matters.

Note- The appearance, taste and odor shall be determined by Sensory evaluation test.

5.2 Hygienic requirement – During processing, handling, storage and transportation, effective measures must be taken to prevent cross contamination with chemicals, microbial or physical contaminants.

5.2.1 The product shall be processed and packed under strict hygienic conditions in premises maintained in accordance with BDS 822.

5.3 Legal requirement – The product shall in all other aspects comply with the requirements of the legislations enforced in the country.

5.4 The material shall also comply with the requirements given under Table 1 and shall not contain the poisonous metal in excess of the limits specified in Table 2.

Table-1 Requirements for Wafer Biscuits

(Clause 5.4)

Sl. No.	Characteristic	Requirements		Method Of Test Ref. To Annex in BDS 383
		Plain	Sandwiched/ Coated	
(1)	(2)	(3)	(4)	(5)
i)	Moisture, percent by mass, Max.	4.5	6.0	B
ii)	Acid insoluble ash (on dry basis), percent by mass, Max.	0.05	0.05	C
iii)	Acidity of extracted fat (as oleic acid), percent by mass, Max.	1.0	1.0	D
Note- In the case of coated wafers, the coating shall be removed before carrying out the tests.				

Table-2 Microbiological and heavy metals limit for Wafer Biscuits
(Clause 5.4)

Sl.No.	Characteristic	Requirement	Method of Test Ref. to
(1)	(2)	(3)	(4)
i.	*E. coli,* cfu/g	Absent	BDS ISO 7251
ii.	*Salmonella,* cfu/g	Absent	BDS ISO 6579-1
iii.	Lead (as Pb), mg/kg, max.	0.2	AOAC 994.02
iv.	Cadmium, mg/kg, max.	0.1	AOAC 999.11

6. Packing and Marking

6.1 **Packing** - Wafers shall be packed in clean, sound containers made of tin plate, cardboard, paper, aluminium foil laminate or other material agreed to between the purchaser and the vendor in such a way as to protect them from contamination and from absorption of moisture. They shall not come in with a packing material other than clean greases proof paper, cellulose film or other non toxic packing material which may be covered with a moisture-proof film, waxed paper or moisture proof laminate or coated paper.

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6.2 **Marking -** The following particulars shall be clearly and indelibly marked or labeled on each packets or containers:

a) Name of the product with brand name, if any

b) Name and full address of the manufacturer

c) Net mass

d) Date of manufacture

e) Batch or code number

f) Best before.....

g) List of ingredients

h) Maximum retail price (MRP)

6.2.1 Each packet or container may also be marked with the BSTI Certification Mark.

Note - The use of BSTI Certification Mark is governed by the provisions of Bangladesh Standards and Testing Institution Act, 2018 and the Rules and Regulations made thereunder. Details of conditions, under which a license for the use of BSTI Certification Mark may be granted to manufacturers or processors, may be obtained from the Bangladesh Standards and Testing Institution.

7. Sampling

7.1 Representative samples of the product shall be drawn as prescribed in Annex-A.

8. Tests

8.1 Tests shall be carried out as prescribed in the appropriate appendices specified in 5.1 and col. 4 of Table-1

8.2 Quality of reagents-Unless specified otherwise pure chemicals shall be employed in tests and distilled water (see BDS 833) shall be used where the use of water as a reagent is intended.

Note - 'Pure chemicals' shall mean chemicals that do not contain any impurities, which affect the results of analysis.

Annex A
(Clause 7)
Methods of Sampling

A-1 General Requirements of Sampling

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

A-1.1 Sample shall be taken in a protected place which is free of odour and not exposed to damp air, dust or soot.

A-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.

A-1.3 The samples shall be placed in air tight, clean and dry glass, metallic containers suitably lacquered or lined and stored in such a manner that the material is not unduly affected.

A-1.4 Each container containing the samples shall be 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.

A-1.5 The samples shall be stored at room temperature.

A-2 Scale of Sampling

A-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.

A-2.1.1 For ascertaining the conformity of the material to the requirements of the specification, samples shall be tested from each lot separately.

A-2.2 The number of packages/containers to be sampled from a lot shall depend upon the size of the lot and shall be in accordance with Table 3.

Table 3 Number of Containers to be Selected for Sampling

Lot Size	Sample Size
(1)	(2)
Up to 50	3
51 to 150	4
151 to 300	5
301 to 500	6
501 to 1 000	8
1 001 and above	10

A-2.3 For the containers shall be selected at random, in case random number tables are not available the following procedure shall be adopted:

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

A-2.3 Test Samples and Referee Samples

A-2.3.1 From each lot, draw the number of containers of biscuits as given in column 2 of Table 3. These containers shall be opened and mixed. From each selected container, about 600 g of biscuits shall be taken from different packets/portions. This quantity of 600 g, after proper mixing, shall be divided into two equal parts of 300 g biscuits each.

The first part of 300 g shall be divided into three equal parts of 100 g each. One of them shall be 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 the particulars as given in A-1.4. Each of these containers of 100 g shall constitute individual test sample. These individual test samples shall be separated into three identical sets of test samples in such a way that each set has a sample representing each selected container.

A-2.3.2 The second part of 300 g shall be suitably powdered and divided into two equal parts of 150 g each. While powdering the biscuits, the following precautions shall be observed:

a) a sample of plain biscuits shall be ground as quickly as possible;

b) the cream, chocolate, jam, jelly or any other filling between biscuits should be removed by gently scraping before powdering the sample;

c) as far as possible, the coating and fillings should be removed before powdering the biscuits except for microbiological requirements; and

d) as the biscuits are highly hygroscopic the preparation of the sample should be done very quickly, preferably in a closed and dry place.

A-2.3.3 Out of these two portions of 150 g each, the first portion shall be divided into three equal parts of 50 g each. These parts shall be transferred immediately to clean, air tight and dry containers which are then scaled and labeled with the particulars as given in A-1.4. Each of these sample containers of 50 g shall constitute individual test sample to be tested for moisture. These individual samples shall be separated into identical sets of test samples 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.

A-2.3.4 Out of the second portion of 150 g, approximately equal quantity of material shall be taken from each container selected from the lot. It shall be thoroughly mixed so as to constitute the composite sample of not less than 450 g. This shall be divided into three equal parts. These parts shall be transferred to clean, air tight and dry containers which are then sealed and labeled with all the particulars given in A-1.4. One of them shall be for the purchaser, another for the vendor and the third for the referee.

A-2.3.5 Referee samples shall consist of a set of individual test samples (*see* A-2.3.1), a set of individual moisture samples (*see* A-2.3.3) and the composite sample (*see* A-2.2.4) and shall bear the seals of the purchaser and the vendor. These shall be kept at a place agreed to between the two so as to be used in case of a dispute.

A-2.4 Number of Tests and Criteria for Conformity

A-2.4.1 The general requirements shall be tested on each of the individual test samples (*see* A-2.3.1).

A-2.4.2 The moisture content shall be tested on individual moisture samples (*see* A-2.3.3).

A-2.4.3 Tests for the determination of remaining characteristics, such as, acid insoluble ash and acidity of extracted fat shall be conducted on the composite sample (*see* A-2.3.4).

A-2.4.4 The lot shall be declared as conforming to the requirements of the relevant material specification if all the test results on individual and composite samples meet the relevant specification requirements.

Annex B
[Table 1, Item (I)]
Determination of Moisture

B-1 General

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-2 Method I

This method involves the use of electrical moisture meters for rapid estimation of moisture in the wafer 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-3 Method II

B-3.1 Apparatus

B-3.1.1 Moisture Dish, made of porcelain, silica, glass or aluminium.

B-3.1.2 Oven, Electric, maintained at 105°C ± 2°C.

B-3.1.3 Desiccator

B-3.2 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°C ± 2°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-3.3 Calculation

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

where
M is mass, in g, of the empty dish;
M_1 is mass, in g, of the dish with the material before drying; and
M_2 is mass, in g, of the dish with the material after drying to constant mass.

Annex C
[Table 1, Sl.No. (ii)]
Determination of Acid Insoluble Ash

C-1 Apparatus

C-1.1 Dish – silica or porcelain.

C-1.2 Muffle Furnace – maintained at 600°C ± 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 wafer biscuit powder in the dish and ash in the muffle furnace at 600°C ± 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, percent by mass = $\frac{100\ (M_1 - M)}{M_2}$

where

M is mass, in g, of the empty dish in which the sample is taken for ashing;
M_1 is mass, in g, of the dish containing acid insoluble ash (see Note) and
M_2 is 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, percent by mass (on dry basis) = $\frac{A \times 100}{100 - M}$

where

A is acid insoluble ash, percent by mass (see C-4.1); and
M is percentage of moisture in the biscuit (*see* B-3.3).

Annex D
[Table 1, Sl. No. (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°C - 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 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 condenser 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 micro burette. 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 is volume of 0.1 M potassium hydroxide solution used and
M is mass, in g, of extracted fat taken for the titration.