Foreword

This Bangladesh Standard was adopted by the Bangladesh Standards and Testing Institution on ..... after the draft finalized by the Paper, Pulp, board and Stationery Products Sectional Committee and approved by the Chemical Divisional Committee.

This standard was first published in 1991 and revised in 2008.

This standard has been formulated in order to define the quality of kraft paper and to assure the availability of proper quality of such paper to the consumers. The kraft paper is meant for wrapping and general packing purposes and is not meant for use in corrugated board box manufacture. The requirements of the kraft liner is covered in a separate standard (see BDS ……. Specification for Kraft liner).

Due to its growing demand the sectional committee decided to revise this standard. While revising this standard the sectional committee gave due consideration to the views of the producers, consumers and technologists and felt that it should be related to the prevailing trade and manufacturing practices followed in this field in the country.

In the preparation of this standard, assistance derived from the following publications is acknowledged with thanks:

IS 1397:2020 Kraft Paper for Packing and Wrapping — Specification; Bureau of Indian Standards.

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 BDS 103.

Bangladesh Standard

Specification for Kraft Paper

(Second Revision)

1. Scope

1.1 This Bangladesh Standard prescribes the requirements, methods of sampling and test for kraft paper for wrapping and general packing purposes.

2. Normative references

2.1 The following Bangladesh Standards are necessary adjuncts to this Standard. For undated references the latest edition of the publication referred to applies.

BDS 103	Rules for rounding off numerical values.
BDS 213	Specification for substances of paper and paper board.
BDS ISO 186	Paper and board - Sampling to determine average quality.
BDS ISO 216	Writing paper and certain classes of printed matter - Trimmed sizes - A and B series, and indication of machine direction.
BDS ISO 287	Paper and board — Determination of moisture content of a lot — Oven-drying method.
BDS ISO 535	Paper and board - Determination of water absorptiveness - Cobb method.
BDS ISO 536	Paper and board - Determination of grammage.
BDS ISO 1924-2	Paper and board - Determination of tensile properties – Part 2: Constant rate of elongation method (20 mm/min).
BDS ISO 2144	Paper, board and pulps - Determination of residue (ash) on ignition at 900°C.
BDS ISO 2758	Paper — Determination of bursting strength.
BDS ISO 4046	Paper, board, pulps and related terms - Vocabulary
Part 1	Alphabetical index.
Part 2	Pulping terminology.
Part 3	Paper making terminology.
Part 4	Paper and board grades and converted products.
Part 5	Properties of pulp, paper and board.
BDS ISO 5626	Paper - Determination of folding endurance.
BDS ISO 6588-2	Paper, board and pulps - Determination of pH of aqueous extracts – Part 2: Hot extraction.
ISO 9197	Paper, board and pulps — Determination of water-soluble chlorides.
ISO 9198	Paper, board and pulp — Determination of water-soluble sulfates.
ISO 14453	Pulps — Determination of acetone-soluble matter.

3. Terms and Definitions

For the purpose of this standard, the definitions given in BDS ISO 4046 part 1-5 and the following shall apply.

3.1 Kraft Paper - It is a paper made from the unbleached pulp and complying with the requirements as laid down in this standard.

4. Grades

4.1 Kraft paper shall be of three grades, namely, Grade 1, Grade 2, and Grade 3.

5. Requirements

5.1 Materials

5.1.1 Grade 1 - Generally it is made from 100 percent unbleached sulphate pulp, or from a mixture of bamboo pulp and wood pulp, or from any other equivalent pulp that will ensure compliance with the requirements given for this grade of kraft paper in Table 1. Grade 1 kraft is normally called virgin kraft by the paper trade and industry.

5.1.2 Grade 2 - It may be made from bagasse, rice/wheat straw, grass, jute, a mixture of these along with sulphate pulp or any other equivalent materials that will ensure compliance with the requirements given for this grade of kraft paper in Table 1. Grade 2 kraft is normally called semi virgin kraft by the paper trade and industry. It is designated as agricultural residue kraft (ARKraft).

5.1.3 Grade 3 - It may be made from 100 percent waste paper or a mixture of waste paper and agricultural waste or any other material that will ensure compliance with the requirements given for this grade of kraft paper in Table 1. Grade 3 kraft is normally called non-virgin kraft by the paper trade and industry.

5.2 Finish

5.2.1 Grade 1 - The surface shall be machine glazed, ribbed or plain or machine finished. The paper shall be of uniform formation, thickness and substance. It will be free from specks, shives, foreign matter, holes and other blemishes. The surface should also be receptive to printing.

5.2.2 Grade 2 - The surface shall be machine finished or machine glazed with reasonably good formation, thickness and substance. It shall generally be free of specks, shives, foreign matter, holes and other blemishes. The surface should be receptive to printing.

5.2.3 Grade 3 - The surface shall be smooth with reasonably good formation and thickness and moderately uniform substance. Specks, shives and foreign matter, although expected to be present, shall be within acceptable limits.

5.3 Size

The size of the rolls shall be as agreed to between the purchaser and the supplier. When in the sheet form, it shall be either of A1 or any other size of A-series as given in BDS ISO 216. The permissible tolerance on the size shall be in accordance with BDS ISO 216.

5.4 Substance

The substance of kraft paper shall be as agreed to between the purchaser and the supplier. A tolerance of ± 5 percent shall be permitted on the nominal substance when tested in accordance with BDS ISO 536.

5.5 Specific requirements - The product shall comply with the specific requirements given in Table 1 when tested in accordance with the method prescribed therein.

Table 1 Specific Requirements for Kraft Paper

Sl. No.	Characteristic	Requirement			Test method
		Grade 1	Grade 2	Grade 3	
(1)	(2)	(3)	(4)	(5)	(6)
i.	Moisture content, percent, Max (as received without conditioning)	9	9	9	BDS ISO 287
ii.	pH, Min.	5.5	5.5	5.5	BDS ISO 6588-2
iii.	Burst index, K.Pa.m^2/g, Min.	2.45	1.95	1.50	BDS ISO 2758
iv.	Tear index (each direction), mN.m^2/g, Min	8.80	6.85	4.90	BDS ISO 2144
v.	Tensile index N.m/g, Min.				BDS ISO 1924 Part 2
	MD	64.0	44.0	29.5	
	CD	34.5	24.5	15.5	
vi.	Folding endurance, CD, Min. (No. of double folds)				BDS ISO 5626
	60 g/m^2	30	18	10	
	80 g/m^2	40	25	16	
vii.	Cobb value, 60 seconds at 27°C, Max.				BDS ISO 535
	Front	30	30	40	
	Back	30	30	40	

NOTE: Burst factor = Burst index × 10.2

Tear factor = Tear index × 10.2

Breaking length, Km = Tensile index × 0.102

5.6 Optional Requirements

When agreed to between the purchaser and the supplier, Grade 1 of the kraft paper shall also comply with the requirements given in Table 2.

Table 2 Optional Requirements for Kraft Paper, Grade 1

Sl. No.	Characteristic	Requirement	Test method
(1)	(2)	(3)	(4)
i.	pH	5.5 to 7.5	BDS ISO 6588-2
ii.	Ash (at 900°C), percent, Max.	7.5	BDS ISO 2144
iii.	Elongation at break, percent, Min.		BDS ISO 1924 Part 2
	CD	3	
	MD	1.3	
iv.	Chlorides (as NaCl), percent by weight, Max	0.02	ISO 9197
v.	Sulphates (as Na_2SO_4), percent by weight, Max	0.12	ISO 9198
vi.	Fatty and/or similar acids (as $C_{17}H_{13}COOH$), percent by weight, Max	0.25	ISO 14453
vii.	Alkalinity (as $CaCO_3$), percent by weight, Max	2.0	Annex A

6. Packaging

6.1 A ream of 500 sheets shall be the measure of quantity for kraft paper in sheets. Packages shall contain 500 or 250 sheets according to the size and the weight of the paper and packed as agreed to between the purchaser and the vendor.

6.2 Kraft paper in rolls shall be rolled on a core of 70-77 mm inside diameter and in length corresponding to the width of the paper, with a wooden/plastic plug at each end extending to a minimum of 75 mm into the core.

7. Marking

7.1 Each package and roll shall be marked with the following information:

a) Description, substance and grade of the paper;

b) Contents of the package (number of sheets);

c) Weight in kg, per ream of 500 sheets including wrapping paper;

d) Size in millimetres;

e) Machine direction;

f) Lot number with date of manufacture;

g) Month and year of manufacture; and

h) Trade-mark, if any.

i) Any other requirement as prescribed by the statutory authorities.

7.2 Roll:

a) Description, substance and grade of the paper;

b) Width of the roll;

c) Weight in kg, of the roll including the weight of the core and the plugs;

d) Lot number;

e) Month and year of manufacture; and

f) Trade-mark, if any.

7.3 The containers may also be marked with the BSTI Certification Mark.

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

8. Sampling

8.1 Representative samples for the test shall be drawn as prescribed in BDS ISO 186.

8.2 Number of Tests - Each of the rolls/packages selected from the lot (see 8.1) shall first be examined for the requirements given in 5.3. Then from each of these rolls/packages, a sheet of suitable size shall be cut out after removing at least the top three layers. Test pieces shall then be cut from these sheets for testing the various requirements mentioned in 5.2, 5.4, 5.5 and 5.6.

A roll or sheet not meeting the requirements for any one or more of these characteristics shall be considered as defective. Test for pH shall be conducted on a composite sample.

8.3 Criteria for Conformity - A lot shall be declared as conforming to the requirements of this specification if the requirement for pH is satisfied and if the number of defective rolls and sheets does not exceed the acceptance number. This acceptance number shall depend on the size of the sample (see 9.1) and shall be equal to 0 if the sample size is less than 13. It shall be equal to 1 if the sample size is greater than or equal to 13.

9. Test Methods

9.1 Tests shall be carried out as prescribed in the method referred to in column 6 of Table 1 and column 4 of Table 2.

9.2 Quality of Reagents

Unless specified otherwise, pure chemicals and distilled water (see BDS 833) shall be employed in tests.

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

Annex A

(Clause 5.6; Table 2)

Determination of Alkalinity

B-1 Reagents

B-1.1 Hydrochloric Acid, 0.02 N.

B-1.2 Standard Sodium Hydroxide Solution, 0.1 N.

B-2 Procedure

Place about 5 g, accurately weighed sample of paper (cut into small pieces) in a stoppered bottle containing 250 mL of 0.02 N hydrochloric acid. Allow the mixture to stand for about one hour with occasional shaking. Decant a portion of this solution and titrate a measured quantity against 0.1 N sodium hydroxide solution using methyl orange as indicator. Carry out a blank titration taking the same volume of hydrochloric acid as of the solution taken in the previous titration.

B-3 Calculations

$$\text{Alkalinity (as } CaCO_3\text{), percent by mass} = \frac{1250(A - B)N}{VW}$$

Where,

A = volume of 0.1 N sodium hydroxide required for the blank titration;

B = volume of 0.1 N sodium hydroxide required for the extract;

N = normality of sodium hydroxide;

V = volume of the extract taken for the titration; and

W = weight of sample taken.