



বাংলাদেশ স্ট্যান্ডার্ডস এন্ড টেস্টিং ইনস্টিটিউশন
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স্মারক নম্বর: ৩৬.০৫.০০০০.২০৩.১৫.০৫০.২৩.২০

২৮ ফাল্গুন ১৪৩০ বঙ্গাব্দ
তারিখ: ১২ মার্চ ২০২৪ খ্রিস্টাব্দ

বিষয়: 'পেপার, পাল্প, বোর্ড এন্ড স্টেশনারী প্রোডাক্টস' (সিএসসি-০৩) শাখা কমিটি কর্তৃক প্রাথমিকভাবে অনুমোদিত খসড়া বাংলাদেশ জাতীয় মানের উপর মতামত আহ্বান প্রসঙ্গে।

উপর্যুক্ত বিষয়ে আদিষ্ট হয়ে জানানো যাচ্ছে যে, জাতীয় মান প্রণয়নের নিমিত্ত বিএসটিআই গঠিত 'পেপার, পাল্প, বোর্ড এন্ড স্টেশনারী প্রোডাক্টস' (সিএসসি-০৩) শাখা কমিটি কর্তৃক নিম্নলিখিত মানগুলি প্রাথমিকভাবে অনুমোদিত হয়েছে:

- i. BDS :2024 Specification for Plain/Photo Copier Paper.
- ii. BDS :2024 Specification for Paper Towels, Hand Towels, Kitchen Towel and Napkin Tissue.
- iii. BDS 405 Part 1:2024 Specification for Writing and Printing Papers — Part 1 Account Book, Azure laid, Bond, Cream Laid and Cream Wove/ Printing White/ Printing Coloured/ Printing Offset, Printing Maplitho, Printing White Super Calendered And Typewriting Types (Third Revision).
- iv. BDS 405 Part 2:2024 Specification for Writing and Printing Papers — Part 2 Air/Manifold, Cartridge Drawing Cartridge White, Duplicating Absorbent and Duplicating Semi-Absorbent and Poster Machine Glazed Types (Third Revision).

২। শাখা কমিটি কর্তৃক প্রাথমিকভাবে অনুমোদিত খসড়া মানগুলি চূড়ান্তভাবে অনুমোদনের পূর্বে আপনার/ আপনার প্রতিষ্ঠানের মতামত আহ্বান করা যাচ্ছে। বিবেচ্য মানটির উপর কোন মতামত যদি থাকে, তবে তা যৌক্তিকতা উল্লেখপূর্বক প্রদানের নিমিত্ত মানটির কপি এতদসঙ্গে প্রেরণ করা হলো।

৩। এমতাবস্থায়, প্রাথমিকভাবে অনুমোদিত খসড়া মানগুলি উপর কোন মতামত যদি থাকে, তবে তা আগামি ৪ এপ্রিল ২০২৪ খ্রিঃ তারিখের মধ্যে নিম্নস্বাক্ষরকারী বরাবর (Email: mksajib@gmail.com) প্রেরণের জন্য অনুরোধ করা হলো।

৪। উল্লেখ্য, নির্ধারিত সময়ের মধ্যে কোনরূপ মতামত পাওয়া না গেলে প্রেরিত মানগুলি সাথে আপনি/আপনার প্রতিষ্ঠান সম্মত রয়েছেন বিবেচনান্তে পরবর্তী কার্যক্রম গ্রহণ করা হবে।

৫। জাতীয় মান প্রণয়নে সকলের সহযোগিতা একান্তভাবে কাম্য।

Mksajib

১২-০৩-২০২৪

জহুরা সিকদার

উপপরিচালক

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বিতরণ(জ্যেষ্ঠতার ক্রমানুসারে নয়):

- ১। ড. এ এন এম হামিদুল কবীর, অধ্যাপক, ফলিত রসায়ন ও কেমিকৌশল বিভাগ, ইঞ্জিনিয়ারিং এন্ড টেকনোলজি অনুষদ, ঢাকা বিশ্ববিদ্যালয়, ঢাকা-১০০০।;
- ২। ড. কৌশিকি সাহা, অধ্যাপক, রসায়ন বিভাগ, জাহাঙ্গীরনগর বিশ্ববিদ্যালয়, সাভার, ঢাকা-১৩৪২।;
- ৩। ড. কৌশিকী কীর্তনীর, সহযোগী অধ্যাপক, কেমিকৌশল বিভাগ, বাংলাদেশ প্রকৌশল বিশ্ববিদ্যালয়, ঢাকা-১০০০।;
- ৪। ড. আবিদা সুলতানা, সহযোগী অধ্যাপক, রসায়ন বিভাগ, ঢাকা বিশ্ববিদ্যালয়, ঢাকা-১০০০।;
- ৫। ড. মোহাম্মদ জাকির হোসাইন, বিভাগীয় কর্মকর্তা, বন রসায়ন বিভাগ, বাংলাদেশ বন গবেষণা ইন্সটিটিউট, চট্টগ্রাম।;
- ৬। ড. মোঃ মোস্তাফিজুর রহমান, সিএসও, ঢাকা গবেষণাগার, বিসিএসআইআর ড. কুদরাত এ খুদা সড়ক, ধানমন্ডি, ঢাকা-১২০৫।;
- ৭। জনাব মুহাম্মদ এনায়েত আলী, জ্যেষ্ঠ পরিচালক (সার্বিক), মাগুড়া পেপার মিলস লিঃ মেঘনাঘাট, সোনারগাঁও, নারায়ণগঞ্জ।;
- ৮। জনাব মোঃ জয়নাল আন্দীন, নির্বাহী সচিব, ঢাকা চেম্বার অব কমার্স অ্যান্ড ইন্ডাস্ট্রি (ডিসিসিআই), ৬৫-৬৬, মতিঝিল বাণিজ্যিক এলাকা জি.পি.ও. ব্লক নং-২৬৪১, ঢাকা-১০০০।;
- ৯। জনাব রুপম বড়ুয়া, রসায়নবিদ, টেকনিক্যাল বিভাগ, কর্ণফুলি পেপার মিলস লিঃ চন্দ্রঘোনা, কাপ্তাই, রাঙ্গামাটি।;
- ১০। জনাব মোঃ মোস্তাফিজুর রহমান, উপ-ব্যবস্থাপনা পরিচালক, বসুন্ধরা পেপার মিলস লিঃ, বসুন্ধরা ইন্ডাস্ট্রিয়াল হেড কোয়ার্টার-২ প্লট-৫৬/এ, বাউক-সি, উম্মে কুলসুম রোড বসুন্ধরা আ/এ, ঢাকা-১২২৯।;
- ১১। জনাব আমিনুল ইসলাম, ব্যবস্থাপক (গবেষণা ও মান নিয়ন্ত্রণ), সিকিউরিটি প্রিন্টিং কর্পোরেশন, ফ্ল্যাট: ০৫, বাড়ি: ১০, রোড: ০৯ সেক্টর: ০১, উত্তরা, ঢাকা-১২৩০।;
- ১২। জনাব মোঃ হানিফ মিয়া, সিনিয়র ডিজিএম, মেঘনা পাল্ল এন্ড পেপার মিলস লিমিটেড, সোনারগাঁও, নারায়ণগঞ্জ এবং
- ১৩। জনাব এ কে এম নওশেরুল আলম, সচিব, বাংলাদেশ পেপার মিলস এসোসিয়েশন (বিপিএমএ), প্লট-৩৩৫(২য় তলা), ব্লক-ডি আলহাজ আব্দুস সোবহান রোড, বসুন্ধরা আ/এ, ঢাকা-১২২৯ (বাংলাদেশ পেপার মিলস এসোসিয়েশন-এর পক্ষে মতামত প্রদানের অনুরোধসহ)।

স্মারক নম্বর:

২৮ ফাল্গুন ১৪৩০ বঙ্গাব্দ
তারিখ: ১২ মার্চ ২০২৪ খ্রিস্টাব্দ

সদয় জ্ঞাতার্থে/জ্ঞাতার্থে(জ্যেষ্ঠতার ক্রমানুসারে নয়):

- ১। পরিচালক, সিএম উইং, বাংলাদেশ স্ট্যান্ডার্ডস এন্ড টেস্টিং ইনস্টিটিউশন (প্রয়োজনীয় ক্ষেত্রে মতামত প্রদানের অনুরোধসহ);
- ২। পরিচালক, রসায়ন পরীক্ষণ উইং, বাংলাদেশ স্ট্যান্ডার্ডস এন্ড টেস্টিং ইনস্টিটিউশন (প্রয়োজনীয় ক্ষেত্রে মতামত প্রদানের অনুরোধসহ);
- ৩। পরিচালক, মান উইং, বাংলাদেশ স্ট্যান্ডার্ডস এন্ড টেস্টিং ইনস্টিটিউশন;
- ৪। পরিচালক (অতিরিক্ত দায়িত্ব), পদার্থ পরীক্ষণ উইং, বাংলাদেশ স্ট্যান্ডার্ডস এন্ড টেস্টিং ইনস্টিটিউশন (প্রয়োজনীয় ক্ষেত্রে মতামত প্রদানের অনুরোধসহ);
- ৫। প্রোগ্রামার, আইসিটি সেল, বাংলাদেশ স্ট্যান্ডার্ডস এন্ড টেস্টিং ইনস্টিটিউশন (বিএসটিআই'র ওয়েবসাইটে আপলোডের জন্য) এবং
- ৬। কম্পিউটার অপারেটর, মহাপরিচালক-এর দপ্তর, বাংলাদেশ স্ট্যান্ডার্ডস এন্ড টেস্টিং ইনস্টিটিউশন (মহাপরিচালক মহোদয়ের সদয় অবগতির জন্য)।



M. M. Rahman

১২-০৩-২০২৪

মঞ্জুর রহমান

উর্ধ্বতন পরীক্ষক

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 had been approved by the Chemical Divisional Committee.

Now a days, the increase of the production of Plain Copier paper, both in the local market and the overseas markets. Keeping in view, the committee has decided to prepare a standard. While preparing the standard due consideration has been given to the views of the consumers, producers, importers and other interested stakeholders.

The myth that any ordinary paper of indeterminate quality can be handled successfully by plain paper copier, made the paper and its products (excluding packaging materials) is addressed by the sectional committee to decide to formulate a specification for plain copier paper, commonly known as photocopier paper.

A wrongly formulated paper can cause never ending customer dissatisfaction and service engineer frustration. Plain paper copiers can tolerate only certain grades of paper.

In the preparation of this standard, assistance have been derived from the following publications:

IS 14490:2018 Plain Copier paper - Specification; Bureau of Indian Standards.

For the purpose of deciding, whether a particular requirement of the standard is complied with, the final value observed or calculated expressing the result of test or analysis, shall be rounded off in accordance with BDS 103.

Bangladesh Standard

Specification for Plain/Photo Copier Paper

1.0 Scope

1.1 This standard prescribes requirements and methods of sampling and tests for plain/photo copier paper (cut size paper in A4, A3, A5, FS, B4, B5, Legal sizes) within the specified grammage (GSM).

2.0 Normative References

The following standards are necessary adjuncts to this standard. For undated reference the latest edition may be used.

BDS 103	Rules for rounding off numerical values.
BDS 832	Method for conditioning of paper and board samples.
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 – Ovendrying method.
BDS ISO 534	Paper and board – Determination of thickness, density and specific volume.
BDS ISO 535	Paper and board – Determination of water absorptiveness - Cobb method.
BDS ISO 536	Paper and board – Determination of grammage.
BDS ISO 1924	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 2470	Paper, board and pulp – Measurement of diffuse blue reflectance factor –
Part 1:	Indoor day light conditions (ISO brightness).
BDS ISO 2471	Paper and board – Determination of opacity (paper backing) – Diffuse reflectance method.
BDS ISO 2493	Paper and board – Determination of resistance to bending –
Part 2:	Taber-type tester.
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 8791	Paper and board – Determination of roughness/smoothness (air leak methods)
Part 2:	Bendtsen method.

3.0 Terminology

For the purpose of this standard, the definitions of terms given in BDS ISO 4046 Part 1-5 shall apply.

4.0 Material - The reel/sheets intended for manufacturing of plain/photo copier paper (cut size) shall conform to requirements of this standard.

5.0 Requirements

5.1 General

The plain/photo copier paper shall be devoid of pinholes when seen through the naked eye (see note 1). The surface shall be well calendered, quite smooth and free from fluff or loose fibers. Surface sizing is desirable for avoiding fluff.

NOTES -

1. Eye unaided by any instrument (other than spectacles for eyesight problem) that changes the apparent size or distance of an object.
2. Chemicals sensitive to heat should be avoided for surface sizing as the waxes and some polymers may adhere to photo conductor surface causing defects in photocopy.

The paper shall have good dimensional stability, thermal stability and shall not have any static charge.

5.2 Moisture

Moisture content shall not be more than 6 percent when tested as per [BDS ISO 287](#).

5.3 Grammage (Substance)

The grammage (substance) of plain copier paper shall be either of 70 g per square metre or 75 g per square metre or 80 g per square metre, when tested as per [BDS ISO 536](#). No single test result shall vary by more than ± 4 percent from the nominal grammage. Further the mean value of 10 test results shall not vary from the nominal grammage by more than ± 2 percent.

The paper under test shall be conditioned as per [BDS 832](#) before it is subjected to this test.

5.4 Thickness

The uniform thickness of paper shall not be less than 95 μm , when tested as per [BDS ISO 534](#).

5.5 The paper shall also comply with the requirements given in Table 1.

5.6 Size

The paper shall be cut size paper in A4, A3, A5, FS, B4, B5, legal sizes along with the permissible tolerance according to [BDS ISO 216](#).

5.7 Additional Requirements for ECO-Mark

5.7.1 General Requirements

5.7.1.1 The product shall conform to the requirements for quality and performance prescribed under 5.1 to 5.5.

5.7.2 Specific Requirements

5.7.2.1 The material shall be manufactured from pulp containing not less than 60 percent by mass of pulp made from materials other than bamboo, hard woods, soft woods and reed.

5.7.2.2 The material shall be manufactured from pulp made from 100 percent waste paper.

Table 1 Requirements for Plain/ Photo Copier Paper
(Clause 5.5)

Sl. No. (1)	Characteristics (2)	Requirements (3)	Method of test Ref. to (4)
i.	ISO brightness, percent, Min.	85	BDS ISO 2470
ii.	Opacity, Percent, Min.	88	BDS ISO 2471
iii.	One Minute Cobb Test, both sides, g/m^2 , Max.	30	BDS ISO 535
iv.	Surface Strength, Dennison (Wax Pick)	No pick on 12A	Annex A
v.	Smoothness for both sides (Bendsten), mL/min, Max.	300	BDS ISO 8791 Part 2
vi.	Ash content (at 900°C), percent by mass, Max.	16	BDS ISO 2144
vii.	Taber stiffness, Min. a) Machine direction (MD) b) Cross direction (CD)	2.0 1.0	BDS ISO 2493 Part 2
viii.	Tear index, $\text{mN.m}^2/\text{g}$. Min a) Machine direction (MD) b) Cross direction (CD)	3.5 4.5	BDS ISO 2144
ix.	Tensile index, mN.m/g . Min a) Machine direction (MD) b) Cross direction (CD)	40 25	BDS ISO 1924 Part 2

6.0 Packing and Marking

6.1 Packing

Each ream containing 500/250 sheets of paper shall be wrapped by means of paper of minimum 80 GSM duly laminated to prevent moisture absorption and shall be strong enough to avoid any external impact during transit. It shall then be either packed in shrink building or 3/5 ply corrugated cartons to ensure that the paper is not damaged due to handling and transportation or shall be packed as agreed to between the purchaser and the supplier. The maximum weight per cartoon should not be more than 40 kg.

For packing 100/50 sheets of paper poly pouch may also be used and label shall be marked as per 6.2.

For ECO-Mark, the product shall be packed in such packages which shall be recyclable/reused or biodegradable.

6.2 Marking

The package shall be marked with the following particulars:

- Description and size of the paper;
- Quantity;
- Mass of 500/250 sheets including wrapping paper, in kg/ream. Chargeable weight should be read as net weight excluding the weight of packing;
- Lot number and month and year of manufacture; and
- Name of manufacturer

6.2.1 For ECO-Mark, following additional information may also be marked on the container/ package: **'The criteria for which the product has been labeled with ECO-Mark'**.

6.2.2 The containers shall 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 thereunder. Details of conditions under which a licence for the use of BSTI Certification Mark may be granted to manufacturers or processors, may be obtained from the Bangladesh Standards and Testing Institution.

7.0 Sampling and Criteria for conformity

7.1 The plain/photo copier paper shall be sampled in accordance with **BDS ISO 186**.

7.2 Tests - From each of the ream, selected from the lot (see 7.1), one sheet shall be taken out at random from each ream subject to total minimum 10 sheets, if selected reams are less than 10. These sheets shall constitute the sample. The sheets selected shall first be tested for general requirements given in 5.1 and 5.6. One test piece shall be cut from each sheet selected for each of the characteristics mentioned in 5.2 and 5.4 and Table 1 and tested. A sheet not meeting the requirements for any one or more characteristics shall be considered as defective.

7.3 Criteria for Conformity - A lot shall be declared as conforming to all the requirements of this standard if the number of defective sheets found does not exceed the acceptance number. The acceptance number shall depend upon the size of the sample and shall be zero if the size is less than 13. The acceptance number shall be one if it is greater than or equal to 13.

Annex A

(Table 1, Sl. No. iv)

Determination of Surface Strength, Dennison (Wax Pick)

A-1 General

A-1.1 Waxes - The Dennison standard paper testing waxes are available in a series with graded adhesive powers. The complete series consists of 18 waxes from 2A to 26A, the adhesive strength increasing with the number. Equivalent waxes may be used if available.

A-2 Procedure

A-2.1 Place the test specimen on a smooth surface, such as a hardwood block or a table. The surface should not be a good conductor of heat, and it should not be artificially cooled before the test. The sample sheet should be separated from the block or table by 8 to 10 sheets of paper.

A-2.2 Select a wax stick and be certain that the end is clean and flat. Heat the end over an alcohol or low gas flame, rotating slowly until several drops of melted wax have fallen. Take care that the wax does not catch fire.

A-2.3 Quickly place the melted wax end on the surface of the specimen, with firm, but not undue, pressure and withdraw the fingers immediately. Allow 15 minutes for the wax to cool.

A-2.4 Place a wooden block with a hole over the wax stick, with the stick protruding through the hole in the block. Press the block down firmly with one hand and with the other pull the wax stick from the sheet with a quick jerk at right angles to the paper surface.

A-2.5 Examine the end surfaces of the wax stick and the specimen.

A-2.6 Record as wax pick number, the highest numbered wax which does not disturb the surface of the board.

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 had been approved by the Chemical Divisional Committee.

Now a day, the production of paper towels and its consumption, both in the local market and the overseas markets are increasing. Due to its growing demand the sectional committee decided to prepare a standard. While preparing the standard due consideration has been given to the views of the consumers, producers, importers and other interested stakeholders.

In the formulation of this standard considerable assistance has been derived from the following publication:

DRS 377:2017 Paper towels — Specification; Rwanda Standards Board.

DEAS 1049:2021 Paper hand towel sheets (multi-fold hand towels) —
Specification; East African Community.

For the purpose of deciding, whether a particular requirement of the standard is complied with, the final value observed or calculated expressing the result of test or analysis, shall be rounded off in accordance with BDS 103.

Bangladesh Standard

Specification for Paper Towels, Hand Towels, Kitchen Towel and Napkin Tissue

1.0 Scope

This standard specifies the requirements, sampling and test methods for paper towels, hand towels, kitchen towel and napkin tissue, in rolls and in sheets (single ply and double ply), suitable for general and industrial purposes.

2.0 Normative references

The following standards are necessary adjuncts to this standard. For undated reference latest edition may be used.

BDS 103	Rules for rounding of numerical values.
ISO 187	Paper, board and pulps - Standard atmosphere for conditioning and testing and procedure for monitoring the atmosphere and conditioning of samples
BDS ISO 6588-1	Paper, board and pulps- Determination of pH of aqueous extracts – Part 1: Cold extraction.
BDS ISO 8784-1	Pulp, paper and board – microbiological examination Part 1: enumeration of bacteria and bacterial spores based on disintegration.
ISO 12625-1	Tissue paper and tissue products – Part 1: Vocabulary.
ISO 12625-2	Tissue paper and tissue products - Part 2: Procedures for sampling and conditioning.
BDS ISO 12625-3	Tissue paper and tissue products – Part 3: Determination of thickness, bulking thickness and apparent bulk density and bulk.
BDS ISO 12625-4	Tissue paper and tissue products — Part 4: Determination of tensile strength, stretch at break and tensile energy absorption.
BDS ISO 12625-5	Tissue paper and tissue products — Part 5: Determination of wet tensile strength.
BDS ISO 12625-6	Tissue paper and tissue products — Part 6: Determination of grammage.
ISO 12625-7	Tissue paper and tissue products — Part 7: Determination of optical properties - Measurement of brightness and colour with D65/10° (outdoor daylight).
BDS ISO 12625-8	Tissue paper and tissue products — Part 8: Water-absorption time and water-absorption capacity, basket-immersion test method.
ISO 12625-15	Tissue paper and tissue products — Part 15: Determination of optical properties — Measurement of brightness and colour with C/2° (indoor daylight) illuminant.

3.0 Terms and definitions

For the purpose of this standard the definitions given in BDS ISO 12625-1 shall apply.

4.0 Requirements

4.1 General requirements

The paper from which products are made shall have a creped or a creped and embossed texture. Paper shall also:

- a) Be white, colour have not been used.

- b) Virgin paper be manufactured from processed cellulose fibres, present a neat, well finished appearance and be free of all imperfections or defects (or both) which might affect appearance, normal life, or serviceability.
- c) Be clean, and be reasonably free from visible wood splinters, specks, holes, tears, wrinkles, abrasive particles, or other imperfections.
- d) Have no disagreeable odour, either wet or dry.
- e) Perfumes have not been used.
- f) Be uniform in colour and trimmed with clean smooth edges.

4.2 Specific requirements

4.2.1 Paper towels: The paper towels shall be single- or double-ply, as specified by the purchaser and shall comply with the appropriate requirements for physical properties as per Table 1.

Table 1 Physical requirements for paper for Paper towels

Sl. No.	Characteristics			Requirements		Test Method
				Single ply	Double ply	
(1)	(2)			(3)	(4)	(5)
i.	Basis Weight g/m ² , Min.			43	43	BDS ISO 12625-6
ii.	Total absorption of water, %, Min			180	250	Annex B BDS ISO 12625-8
iii.	Rate of absorption of 0.02 mL of water, second, Max.			50	5	Annex C BDS ISO 12625-8
iv.	Tensile strength, N/m, Min.	Wet	CD	23	23	BDS ISO 12625-5
			MD	50	50	
		Dry	CD	160	160	BDS ISO 12625-4
			MD	350	350	
v.	pH value, permissible range			4.4-10.0	4.4-10.0	BDS ISO 6588-1

4.2.2 Hand towels: The hand towels shall be single- or double-ply, as specified by the purchaser and shall comply with the appropriate requirements for physical properties as per Table 2.

Table 2 Physical requirement for Hand towels

Sl. No.	Characteristics			Requirements			Test Method
				Virgin Grade		Recycle Grade 01 ply	
				01 ply	02 ply		
(1)	(2)			(3)	(4)	(5)	(6)
1.	Basis Weight g/m ² , Min.			34	17	28	BDS ISO 12625-6
2.	Tensile strength, N/m, Min.	Dry	MD	200	120	150	BDS ISO 12625-4
			CD	90	50	70	
		Wet	MD	20	12	15	BDS ISO 12625-5
			CD	9	5	7	
3.	Brightness (ISO), %, Min.			85	85	70	BDS ISO 12625-7
4.	pH, permissible range			6.0-8.50			BDS ISO 6588-1
5.	Thickness, Micron, Min.			140	80	110	BDS ISO 12625-3
6.	Water absorption Capacity, gm/gm, Min			4.0	4.0	5.0	BDS ISO 12625-8

4.2.3 Kitchen towels: The kitchen towels shall be double-ply and shall comply with the appropriate requirements for physical properties as per Table 3.

Table 3 Physical requirement for Kitchen towels

Sl. No.	Characteristics		Requirements Virgin Grade (02 ply)		Test Method
(1)	(2)		(3)		(4)
1.	Basis Weight g/m ² , Min.		23		BDS ISO 12625-6
2.	Tensile strength, N/m, Min.	Dry	MD	185	BDS ISO 12625-4
			CD	80	
		Wet	MD	19	BDS ISO 12625-5
			CD	8	
3.	Brightness (ISO), %, Min.		85		BDS ISO 12625-7
4.	pH, permissible range		6.0-8.50		BDS ISO 6588-1
5.	Thickness, Micron, Min.		100		BDS ISO 12625-3
6.	Water absorption Capacity, gm/gm, Min		5.0		BDS ISO 12625-8

4.2.4 Napkin Tissue: The hand towels shall be single- or double-ply, as specified by the purchaser and shall comply with the appropriate requirements for physical properties as per Table 4.

Table 4 Physical requirement for Napkin Tissue

Sl. No.	Characteristics			Requirements			Test Method
				Virgin Grade		Recycle Grade 01 ply	
				01 ply	02 ply		
(1)	(2)			(3)	(4)	(5)	(6)
1.	Basis Weight g/m ² , Min.			19	15	19	BDS ISO 12625-6
2.	Tensile strength, N/m, Min.	Dry	MD	180	140	150	BDS ISO 12625-4
			CD	60	50	60	
		Wet	MD	18	14	15	BDS ISO 12625-5
			CD	7	5	5	
3.	Brightness (ISO), %, Min.			85	85	70	BDS ISO 12625-7
4.	pH, permissible range			6.0-8.50			BDS ISO 6588-1
5.	Thickness, Micron, Min.			90	75	90	BDS ISO 12625-3
6.	Water absorption Capacity, gm/gm, Min			5.0			BDS ISO 12625-8

4.3 Microbiological Requirements

4.3.1 The paper towels, hand towels, kitchen towel and napkin tissue shall also comply with the microbiological requirements as per Table 5.

Table 5 Microbiological Limit

Sl. No.	Characteristics	Requirements	Test Method
1.	a) Total plate count, cfu/g, Max.	300	BDS ISO 8784-1
	b) <i>Pseudomonas aeruginosa</i> , cfu/g	Not detected in 1 g of the product	BDS ISO 8784-1
	c) <i>Staphylococcus aureus</i> , cfu/g		
	d) <i>Candida albicans</i> , cfu/g		
	e) <i>Escherichia coli</i> , cfu/g		

4.4 Dimensions

4.4.1 Paper Towels:

4.4.1.1 The length and width of the sheets of paper towel shall be as specified on the packaging.

4.4.1.2 The number of sheets per packet and per perforated roll of paper towel, shall

- a) unless otherwise specified by the purchaser, be in accordance with acceptable commercial practice,
- b) not be less than 2% nor exceed 4% of the quantity marked on the packet or perforated roll in no more than one sample roll per ten.

4.4.1.3 The length of an unperforated roll shall not be less than $\pm 2\%$ of the length specified by the purchaser and if not specified, then as in accordance with acceptable commercial practice. In the case of rolls, the quantity of sheets or the roll length (as relevant) shall be such that (unless the number of sheets or the roll length specified by the purchaser renders it impossible) the diameter of a roll does not exceed 125 mm when determined as per annex A.

4.4.2 Hand Towels - The hand towels shall be in sheet form complying with the appropriate sizes given in Table 6.

Table 6 Dimension of Hand Towels

Sl. No.	Characteristics	Requirements		Test Method
		Size (mm)	No of sheet per packet	
1.	Regular	$(210 \times 200) \pm 5$	$(100 \text{ to } 250) \pm 5$	Annex A
2.	Regular	$(220 \times 200) \pm 5$		

4.4.3 Kitchen Towels - The size of sheets of kitchen towels shall be general purposes or as agreed to between the purchaser and the supplier. The product shall be in the form of rolls and shall be free from irregularity. The paper width, length per roll and core diameter shall be as shown in table 7. However, the length per roll may be specified in other dimensions than those shown in table 7 by agreement between the purchaser and the supplier.

Table 7 Dimension of Kitchen Towels

Sl. No.	Characteristics	Requirements		Test Method
		Size (mm)	No of sheet per packet	
1.	Regular	$(225 \times 228) \pm 5$	$(80 \text{ to } 100) \times 2 \pm 5$	Annex A
2.	Regular	$(225 \times 220) \pm 5$		
3.	Regular	$(225 \times 230) \pm 5$	90 ± 5	
4.	Core Diameter (inner)	50 ± 2	-	

4.4.4 Napkin Tissue - The napkin tissue shall be in sheet form complying with the appropriate sizes given in Table 8.

Table 8 Dimension of Napkin Tissue

Sl. No.	Characteristics	Requirements		Test Method
		Size (mm)	No of sheet per packet	
1.	Regular	$(330 \times 330) \pm 5$	$(50 \text{ to } 100) \pm 5$	Annex A
2.	Regular	$(254 \times 254) \pm 5$		
3.	Regular	$(254 \times 190) \pm 5$		
4.	Regular	$(203 \times 190) \pm 5$		
5.	Regular	$(380 \times 380) \pm 5$		
6.	Regular	$(430 \times 430) \pm 5$		

4.5 Perforation - When tested in accordance with Annex D, every sheet of a perforated roll shall be severed along the perforation and the tear shall be manifestly due to the perforation only.

5.0 Packing

5.1 Paper towels:

Paper towels shall be supplied in packets or in rolls or as specified by the purchaser.

When the products are supplied in rolls, the rolls shall be perforated or unperforated, as specified by the purchaser. The quality of perforations shall comply with the requirements of 4.5.

When packets of folded towels are supplied, the folds shall be regular, the edges clean cut, and towels presented in such a way that they can be taken from a suitable dispensing cabinet without sticking or other undue difficulty.

5.2 Hand towels and Napkin Tissue:

Hand towel and napkin tissue shall be supplied in packets or any suitable containers of as mutually agreed by the purchaser and the vendor. Only sheets of the same size shall be packed tighter in the container.

When packets of folded hand towel/napkin tissue are supplied, the folds shall be regular, the edges clean cut, and hand towel/napkin tissue presented in such a way that they can be taken from a suitable dispensing cabinet without sticking or other undue difficulty.

5.3 Kitchen towels: Kitchen towels shall be supplied in rolls or as specified by the purchaser. Packaging of the product shall be performed by taking one roll or several rolls got together as the minimum packaging unit and placing such unit in a suitable carton/box/package taking the transport conditions and the like into consideration.

The rolls shall be perforated or unperforated, as specified by the purchaser. The quality of perforations shall comply with the requirements of 4.5.

Unless otherwise specified by the purchaser each roll of paper towels shall be completely covered by a wrapper

6.0 Containers or bulk packages

Packets and rolls shall be packed in acceptable corrugated board containers or bulk packages and the quantity per container shall be as specified by the purchaser. Only packets or rolls of the same grade, ply, texture, colour (unless packing together of packets of different colours is required by the purchaser), and number and size of sheets (or, in the case of unperforated rolls, roll width and length) shall be packed together in a bulk container.

7.0 Marking

7.1 Packets and Wrappers

The following information shall appear in legible and indelible marking on each packet and wrapper:

- a) Name of the product;
- b) Name and address of the manufacturer with recognized trademark, if any;
- c) Number and size of sheets or roll length as relevant;
- d) Ply of the paper;

- e) Country of origin/manufacture.
- f) Month and year of manufacturing/packing;
- g) Batch or Lot number, in code or otherwise;
- h) Maximum retail price; and
- i) Any other requirement as prescribed by the statutory authorities.

7.2 Bulk packs - The following information shall appear in legible and indelible marking on each bulk container:

- a) Information required in terms of 7.1.(a) to 7.1.(i);
- b) Number of packets or rolls.

7.2.1 The packages and container may also be marked with, the BSTI Certification Mark.

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

8.0 Sampling

Use the sampling procedures given in Table 9 and to determine whether a lot complies with the relevant requirement of this draft standard, and deem the samples so taken to represent the lot for the respective properties.

Table 9 Sampling

Lot Size Rolls or Packets	Sample for Inspection			Sample for dimensional checks and testing rolls or packets
	Containers	Rolls or packets	Acceptance number	
(1)	(2)	(3)	(4)	(5)
10 – 100	2	10	0	4
101 – 300	3	15	1	5
301 – 1000	4	20	2	6
1001 – 4000	6	30	3	7
4001 – 10000	8	40	4	8

Annex A

(Normative)

Determination of Dimensions

A-1 Conditioning

Precondition and condition all tissue paper and tissue products under test in accordance with ISO 187/ ISO 12625-2, using the conditioning atmosphere designated, (23 ± 1) °C and (50 ± 2) % RH (Relative Humidity), and carry out the tests given in 4.2 and 4.3 in an atmosphere maintained at these conditions.

Also during conditioning, ensure that test pieces and test sheets are laid flat instead of being suspended, as in the latter case their properties to be tested might be affected.

A-2 Dimensions

Measure, to the nearest 1 mm without stretching the sample and when relevant, count the sheets in each packet or roll drawn for compliance with the appropriate requirements of 4.4.

Determine the width and length of sheets on two sheets taken at random from each packet or roll. Record the results of the checks in respect of each requirement

Annex B

(Normative)

Determination of Total Water Absorption

B-1 Test specimens – From the sample, cut ten test specimens and condition them as per A-1 above.

B-2 Apparatus – Balance, that has a sensitivity of 1 mg (or better). Drainage strip, that consists of a piece of wet towel-paper of size 3 mm x 40 mm.

B-3 Procedure

Determine the mass of a test specimen and submerge it in distilled water for 2 minutes.

Remove, press onto one corner of the test specimen a drainage strip, so that the longitudinal axis of the strip forms a continuation of the diagonal of the test specimen, and then suspend the assembly by diagonally opposite corner over water in a vessel that has a tight-fitting cover.

Close the vessel, allow the test specimen to drain for 30 minutes, and then remove it, discard the drainage strip, place the test specimen in a tared weighing bottle, and determine its mass.

Test each specimen in this way, and from the results.

B-4 Calculation – Calculate and record the average total absorption (i.e. the percentage increase in mass based on the original dry mass) for each packet/roll and for the sample.

Annex C

(Normative)

Determination of Rate of Water Absorption

C-1 Test specimens – From the sample, cut ten test specimens and condition them as per A-1. Test half of the test specimens from one side of the paper and the other half from the other side.

C-2 Apparatus

C-2.1 Water applicator – that consists of a micrometer syringe or a suitable pipette that can deliver accurately 0.01 mL or 0.02 mL of water.

C-2.2 Stopwatch.

C-3 Procedure

Place a test specimen on the rim of a beaker that has a diameter of approximately 50 mm.

Fill the syringe with distilled water at (23 ± 1) °C and ensure that trapped air bubbles are removed.

Hold the syringe at an angle of about 30° to the horizontal with the tip nearly in contact with the paper, and allow the required millilitres of water to flow onto the test specimen.

Keep the tip of the syringe in the drop of water until delivery is complete.

Measure with the stopwatch the rate of absorption, in seconds, from the instant the water touches the test specimen until the drop of water is completely absorbed, as indicated by no further reflection of light from it when viewed at an angle.

Carry out five tests on each side of the paper.

C-4 Calculation – Calculate and report to three significant figures of the average water absorption rate in seconds. Check for compliance with Table 1.

NOTE – For paper towels, disposable and paper-towel rolls for centre-feed devices 0.02 mL of water should be allowed to flow onto the test specimen.

Annex D

(Normative)

Assessment of Perforation

D-1 Test specimen

Use all the perforated rolls drawn in accordance with Table 9.

D-2 Procedure

At a position chosen at random on the roll under test, detach a sheet by holding it between thumb and forefinger at its perforated end and exerting a steady pull at an angle of about 10° to the edge of the roll.

Carry out the test on five consecutive sheets in each roll.

Examine the torn ends for compliance with 4.5.

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 had been approved by the Chemical Divisional Committee.

This Standard was first published in 1964 and subsequently revised in 1996 (amended in 2006) and 2012. The Committee responsible for the formulation of this standard decided to revise it further. In this revision, the standard has splitted into two parts. The 19 different varieties covered in one standard in second revision were divided in two parts of standard based on application of varieties of writing and printing paper.

This part covers account book, azure laid, bond, cream laid and cream wove/printing white/printing coloured/printing offset, printing maplitho, printing white, super calendered and typewriting varieties of writing and printing papers.

The requirements have been modified and upgraded in this revised edition. The requirement of mechanical pulp has been made more stringent by reducing its limit. The clause for selection of sample size for determination of substance has been modified. There requirement of *pH* has been modified. Packaging and marking clause has also been modified. References of latest available test method standards have also be made in this standard. Some of the varieties which are not at all being used have been removed.

In the preparation of this standard, assistance have been derived from the following publications:

IS 1848 (Part 1):2018 Specification for Writing And Printing Papers;
Bureau of Indian Standards.

For the purpose of deciding, whether a particular requirement of the standard is complied with, the final value observed or calculated expressing the result of test or analysis, shall be rounded off in accordance with BDS 103.

Bangladesh Standard

Specification for Writing and Printing Papers — Part 1 Account Book, Azure laid, Bond, Cream Laid and Cream Wove/ Printing White/ Printing Coloured/ Printing Offset, Printing Maplitho, Printing White Super Calendered And Typewriting Types (Third Revision)

1.0 Scope

1.1 This standard prescribes requirements and methods of sampling and test for writing and printing papers.

1.2 This standard covers account book, azure laid, bond, cream laid and cream wove/printing white/printing coloured/printing offset, printing maplitho, printing white super calendered and typewriting varieties of writing and printing papers.

2.0 Normative References

The following standards are necessary adjuncts to this standard. For undated reference the latest edition may be used.

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 534	Paper and board - Determination of thickness, density and specific volume
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 2470	Paper, board and pulp -Measurement of diffuse blue reflectance factorPart 1: indoor day light conditions (ISO brightness)
BDS ISO 2471	Paper and board-Determination of opacity (paper backing) - Diffuse reflectance method.
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.
BDS ISO 8791-2	Paper and board -Determination of roughness/smoothness (air leak methods) Part 2: Bendtsen method.
ISO 8254-1	Paper and board — Measurement of specular gloss — Part 1: 75 degree gloss with a converging beam, TAPPI method
ISO 8254-2	Paper and board — Measurement of specular gloss — Part 2: 75 degree gloss with a parallel beam, DIN method
ISO 10376	Pulps — Determination of mass fraction of fines

3.0 Terminology

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

4.0 Requirements

4.1 Writing and printing papers shall be uniform formation, machine finished (MF) and shall be free from specks, holes and other blemishes. When tested according to ISO 10376, the furnish for all varieties shall not contain more than 15 percent mechanical pulp.

4.2 The substance of writing and printing papers shall be as prescribed in BDS 213. For determination of substance, select 10 sheets at random and cut a test piece of size 25 cm x 25 cm from each sheet. In case the sample size is not sufficient, select 20 sheets and cut a test piece of size 10 cm x 10 cm. Proceed as prescribed in BDS ISO 536.

4.2.1 No single test result shall vary by more than ± 5 percent from the nominal substance. Further, the mean of 10/20 test results (whichever is applicable) shall not vary from the nominal substance by more than ± 2.5 percent (see note 1). However, where 2.5 percent of mean of 10/20 test results (whichever is applicable) as calculated above is less than 1.5 g/m², the tolerance shall be ± 1.5 g/m².

NOTE – 1. For white printing paper, cream-wove and cream laid paper, the mean of 10 test results shall not vary from the nominal substance (grammage) by more than ± 4 per cent and no single test result shall vary by more than ±8 percent from the nominal grammage.

4.2.2 The tolerance of ± 2.5 percent shall be allowed on the mass of the ream, when calculated according to the following formula (see Note):

$$R = \frac{(A \times B \times C) + D}{1000}$$

Where,

- A = nominal substance of paper, in g/m²;
- B = nominal number of sheets of paper in a ream;
- C = nominal area of each sheet, in m²;
- D = nominal mass of the wrapping paper, in g; and
- R = nominal mass of ream of paper, in kg.

NOTE – 2. The chargeable weight should be net weight excluding the weight of packing.

4.3 A tolerance of ± 10 percent or ± 20 microns, whichever is less, shall be permitted on the nominal thickness, if specified by the purchaser, when tested according to BDS ISO 534.

4.4 Sizes and Tolerance on Size

Trimmed sizes of writing and printing papers shall be in accordance with BDS ISO 216. The permissible tolerance on the size shall be in accordance with BDS ISO 216.

4.5 The hot extract pH value for all types of writing and printing papers shall be not less than 6.5 when tested according to BDS ISO 6588-2 or the following test method:

Test method: Weight accurately 1.5g of sample into a 200 mL beaker. Add 150 mL distill water and boil for 10 minutes. Cool at 25°C and measure the pH using a pH meter.

4.6 The writing and printing papers shall also comply with the requirements given in Table 1.

4.7 In the case of coloured paper, the colour should be an approximate match to the shade approved by the purchaser. The requirement for brightness shall not apply in case of coloured paper and printed paper. (See Table 1)

4.8 Additional Requirements for ECO-Mark (Optional)

4.8.1 General Requirements

4.8.1.1 The product shall conform to the requirements for quality and performance prescribed in 4.1 to 4.7.

4.8.2 Specific Requirements

4.8.2.1 The paper and paper boards manufactured out of pulp containing not less than 60 percent by weight of pulp made from materials other than bamboo, hardwoods, softwoods and reed.

4.8.2.2 Recycled paper and paper board must be made from 100 percent waste paper.

5. Packing and Marking

5.1 Packing

The packing of paper shall be done so as to ensure that the paper is not damaged due to handling, transportation and prevailing climatic condition of the area and shall be as agreed to between the purchaser and the supplier.

5.1.1 For ECO-Mark, the product shall be packed in such packages which shall be recyclable/ reusable or biodegradable.

5.2 Marking

Each package shall be marked with the following particulars:

- a) Description and substance of the paper, in g/m²;
- b) Size of the paper;
- c) Mass of 500 sheets including wrapping paper, in kg/ream. Chargeable weight should be read as net weight excluding the weight of packing.
- d) Lot/ batch number;
- e) Month and year of manufacture;
- f) Name and address of manufacturer; and
- g) Any other requirement as prescribed by the statutory authorities.

5.2.1 For ECO-Mark, following additional information may also be marked on the container/package: The criteria for which the product has been labelled with ECO-Mark

5.2.2 The containers shall 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 thereunder. Details of conditions under which a licence for the use of BSTI Certification Mark may be granted to manufacturers or processors, may be obtained from the Bangladesh Standards and Testing Institution.

6. Sampling

6.1 Representative samples of the material shall be drawn as prescribed in BDS ISO 186.

6.2 Number of Tests

Each of the selected units shall first be tested for requirements given in 4.2. Then from each of these units, number of sheets sufficient to carry out all tests specified in Table 1 shall be taken out at random. The sheets shall first be examined for the requirements given in 4.1, 4.3, 4.4, 4.5 and 4.7 and then number of test pieces for each of the characteristic as indicated in its test method shall be cut from them. These pieces shall be tested according to the methods specified in Table 1.

6.3 Criterion for Conformity

6.3.1 A sheet not meeting the relevant requirements for any one or more characteristics shall be considered as defective.

6.3.2 A lot shall be declared as conforming to the requirements of this specification, if the number of defective sheets found, does not exceed the acceptance number. This acceptance number is zero for the requirement for substance (see 4.2) and for all other requirements depends upon the size of the sample and shall be equal to zero, if the size is less than 13 and 1, if the size is greater than or equal to 13.

Table 1: Requirements for Writing and Printing Papers
(Clauses 4.6, 4.7 and 6.2)

SI No	Type of Paper	Tensile Index Nm/g		Brightness ISO ^{1*} , Percent Min.	Opacity Percent Min.	One Minute Cobb Test Max. Average	Double Fold Min.		Gloss ^{2**} Percent Min.	Wax Pick	Smoothness (Bendtsen) mL/min. Min.	Tear Index mN.m ² /g Min.	
		CD	MD				CD	MD				CD	MD
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
1	Account book	17	25	80	85	25	10	15	-	No pickon 8A	300	4.0	3.5
2	Azure laid	17	25	-	85	25	10	15	-	-	280	4.0	3.5
3	Bond	25	40	90	90	25	10	15	-	-	350	5.0	4.0
4	Cream laid and Cream wove/ Printing white/ printing coloured/ printing offset	17	25	78	85	25	-	-	-	No pickon 8A	300	4.0	3.5
5	Printing white	17	25	78	85	23-28	-	-	-	No pickon 8A	300	4.0	3.5
6	Printing, maplitho	20	30	82	85	25	10	15	-	No pickon 8A	300	4.0	3.5
7	Printing , white super Calendered	17	25	80	75	25	-	-	15	-	-	4.0	3.5
8	Typewriting Types	20	25	75	-	25	-	-	-	-	300	4.0	3.5
9	Antique wove and antique laid	17	25	72	80	25	--	--	--	--	-	4.0	3.5
10	Printing Semibleaced	17	25	45	80	25	--	--	--	--	-	4.0	3.5
11	Printing unbleached	17	25	--	80	25	--	--	--	--	-	4.0	3.5
12	BDS ISO 1924-2	√	√	-	-	-	-	-	-	-	-	-	-
13	BDS ISO 2470	-	-	√	-	-	-	-	-	-	-	-	-
14	BDS ISO 2471	-	-	-	√	-	-	-	-	-	-	-	-
15	BDS ISO 535	-	-	-	-	√	-	-	-	-	-	-	-
16	BDS ISO 5626	-	--	-	-	-	√	√	-	-	-	-	-
17	Annex A, ISO 8254 P-1 & 2	-	-	-	-	-	-	-	√	-	-	-	-
18	Annex B	-	-	-	-	-	-	-	-	√	-	-	-
19	BDS ISO 8791 (P-2)	-	-	-	-	-	-	-	-	-	√	-	-
20	BDS ISO 2144	-	-	-	-	-	-	-	-	-	-	√	√

^{1*} Only for white papers.

^{2*} Tensile index = (Breaking length × 0.0098); Tear index = (Tear factor × 0.098)

CD = Cross direction and MD = Machine direction

Annex A

(Table 1)

Determination of Gloss

A-1 General - This test is performed to find the degree of specular reflectance of papers like super calendered, imitation art and art.

A-2 Apparatus-The following apparatus is recommended.

A-2.1 Ingersol Glarimeter - For paper of low gloss (15 per cent reflectance and below).

A-2.2 Photo-Electric Reflection Meter-For paper of high gloss (15 to 75 per cent reflectance) employing an angle of 75°.

A-3 Procedure-Determine the reflectance of each specimen by the method appropriate to the instrument used, utilizing the table supplied with the instrument.

A-4 Report-Report the mean, minimum and maximum results for the top-side and wire-side separately.

Annex B

(Table 1)

Determination of Wax Pick Number

B-1 General

B-1.1 Waxes-The Dennison standard paper testing waxes are available in a series with graded adhesive powers. The complete series consists of 18 waxes from 2A to 26A, the adhesive strength increasing with the number. Equivalent waxes may be used if available.

B-2 Procedure

B-2.1 Place the test specimen on a smooth surface, such as a hardwood block or a table. The surface should not be a good conductor of heat, and it should not be artificially cooled before the test. The sample sheet should be separated from the block or table by 8 to 10 sheets of paper.

B-2.2 Select a wax stick and be certain that the end is clean and flat. Heat the end over an alcohol or low gas flame, rotating slowly until several drops of melted wax have fallen. Take care that the wax does not catch fire.

B-2.3 Quickly place the melted wax end on the surface of the specimen, with firm, but not undue, pressure and withdraw the fingers immediately. Allow 15 minutes for the wax to cool.

B-2.4 Place a wooden block with a hole over the wax stick, with the stick protruding through the hole in the block. Press the block down firmly with one hand and with the other pull the wax stick from the sheet with a quick jerk at right angles to the paper surface.

B-2.5 Examine the end surfaces of the wax stick and the specimen.

B-2.6 Record as wax pick number, the highest numbered wax which does not disturb the surface of the board.

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 had been approved by the Chemical Divisional Committee.

This Standard was first published in 1964 and subsequently revised in 1996 (amended in 2006) and 2012. The Committee responsible for the formulation of this standard decided to revise it further. In this revision, the standard has splitted into two parts. The 19 different varieties covered in one standard in second revision were divided in two parts of standard based on application of varieties of writing and printing paper.

This part covers air/manifold, cartridge drawing cartridge white, duplicating absorbent and duplicating semi-absorbent and poster machine glazed types.

The requirements have been modified and upgraded in this revised edition. The requirement of mechanical pulp has been made more stringent by reducing its limit. The clause for selection of sample size for determination of substance has been modified. There requirement of pH has been modified. Packaging and marking clause has also been modified. References of latest available test method standards have also be made in this standard. Some of the varieties which are not at all being used have been removed.

In the preparation of this standard, assistance have been derived from the following publications:

IS 1848 (Part 1):2018 Specification for Writing And Printing Papers;
Bureau of Indian Standards.

For the purpose of deciding, whether a particular requirement of the standard is complied with, the final value observed or calculated expressing the result of test or analysis, shall be rounded off in accordance with BDS 103.

Bangladesh Standard

Specification for Writing and Printing Papers —
Part 2 Air/Manifold, Cartridge Drawing Cartridge White,
Duplicating Absorbent and Duplicating Semi-Absorbent and
Poster Machine Glazed Types
(Third Revision)

1.0 Scope

1.1 This standard prescribes requirements and methods of sampling and test for writing and printing papers.

1.2 This standard covers air/manifold, cartridge drawing cartridge white, duplicating absorbent and duplicating semi-absorbent and poster machine glazed types of writing and printing papers.

2.0 Normative References

The following standards are necessary adjuncts to this standard. For undated reference the latest edition may be used.

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 534	Paper and board - Determination of thickness, density and specific volume
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 2470	Paper, board and pulp -Measurement of diffuse blue reflectance factorPart 1: indoor day light conditions (ISO brightness)
BDS ISO 2471	Paper and board-Determination of opacity (paper backing) - Diffuse reflectance method.
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.
BDS ISO 8791-2	Paper and board -Determination of roughness/smoothness (air leak methods) Part 2: Bendtsen method.
ISO 8254-1	Paper and board — Measurement of specular gloss — Part 1: 75 degree gloss with a converging beam, TAPPI method
ISO 8254-2	Paper and board — Measurement of specular gloss — Part 2: 75 degree gloss with a parallel beam, DIN method
ISO 10376	Pulps — Determination of mass fraction of fines

3.0 Terminology

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

4.0 Requirements

4.1 Writing and printing papers shall be uniform formation, machine finished (MF) and shall be free from specks, holes and other blemishes. When tested according to **ISO 10376**, the furnish for all varieties shall not contain more than 15 percent mechanical pulp.

4.2 The substance of writing and printing papers shall be as prescribed in BDS 213. For determination of substance, select 10 sheets at random and cut a test piece of size 25 cm x 25 cm from each sheet. In case the sample size is not sufficient, select 20 sheets and cut a test piece of size 10 cm x 10 cm. Proceed as prescribed in BDS ISO 536.

4.2.1 No single test result shall vary by more than ± 5 percent from the nominal substance. Further, the mean of 10/20 test results (whichever is applicable) shall not vary from the nominal substance by more than ± 2.5 percent (see note 1). However, where 2.5 percent of mean of 10/20 test results (whichever is applicable) as calculated above is less than 1.5 g/m², the tolerance shall be ± 1.5 g/m².

NOTE – 1. For white printing paper, cream-wove and cream laid paper, the mean of 10 test results shall not vary from the nominal substance (grammage) by more than ± per cent and no single test result shall vary by more than ±8 percent from the nominal grammage.

4.2.2 The tolerance of ± 2.5 percent shall be allowed on the mass of the ream, when calculated according to the following formula (see Note):

$$R = \frac{(A \times B \times C) + D}{1000}$$

Where,

- A = nominal substance of paper, in g/m²;
- B = nominal number of sheets of paper in a ream;

- C = nominal area of each sheet, in m²;
- D = nominal mass of the wrapping paper, in g; and
- R = nominal mass of ream of paper, in kg.

NOTE - 2. The chargeable weight should be net weight excluding the weight of packing.

4.3 A tolerance of ± 10 percent or ± 20 microns, whichever is less, shall be permitted on the nominal thickness, if specified by the purchaser, when tested according to BDS ISO 534.

4.4 Sizes and Tolerance on Size

Trimmed sizes of writing and printing papers shall be in accordance with BDS ISO 216. The permissible tolerance on the size shall be in accordance with **BDS ISO 216**.

4.5 The hot extract pH value for all types of writing and printing papers shall be not less than 6.5 when tested according to BDS ISO 6588-2 or the following test method:

Test method: Weight accurately 1.5g of sample into a 200 mL beaker. Add 150 mL distill water and boil for 10 minutes. Cool at 25°C and measure the pH using a pH meter.

4.6 The writing and printing papers shall also comply with the requirements given in Table 1.

4.7 In the case of coloured paper, the colour should be an approximate match to the shade approved by the purchaser. The requirement for brightness shall not apply in case of coloured paper and printed paper. (See Table 1)

4.8 Additional Requirements for ECO-Mark

4.8.1 General Requirements

4.8.1.1 The product shall conform to the requirements for quality and performance prescribed in 4.1 to 4.7.

4.8.2 Specific Requirements

4.8.2.1 The paper and paper boards manufactured out of pulp containing not less than 60 percent by weight of pulp made from materials other than bamboo, hardwoods, softwoods and reed.

4.8.2.2 Recycled paper and paper board must be made from 100 percent waste paper.

5. Packing and Marking

5.1 Packing

The packing of paper shall be done so as to ensure that the paper is not damaged due to handling, transportation and prevailing climatic condition of the area and shall be as agreed to between the purchaser and the supplier.

5.1.1 For ECO-Mark, the product shall be packed in such packages which shall be recyclable/ reusable or biodegradable.

5.2 Marking

Each package shall be marked with the following particulars:

- a) Description and substance of the paper, in g/m²;

- b) Size of the paper;
- c) Mass of 500 sheets including wrapping paper, in kg/ream. Chargeable weight should be read as net weight excluding the weight of packing.
- d) Lot/ batch number;
- e) Month and year of manufacture; and
- f) Name and address of manufacturer.
- g) Any other requirement as prescribed by the statutory authorities.

5.2.1 For ECO-Mark, following additional information may also be marked on the container/package: The criteria for which the product has been labelled with ECO-Mark

5.2.2 The containers shall 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 thereunder. Details of conditions under which a licence for the use of BSTI Certification Mark may be granted to manufacturers or processors, may be obtained from the Bangladesh Standards and Testing Institution.

6. Sampling

6.1 Representative samples of the material shall be drawn as prescribed in BDS ISO 186.

6.2 Number of Tests

Each of the selected units shall first be tested for requirements given in 4.2. Then from each of these units, number of sheets sufficient to carry out all tests specified in Table 1 shall be taken out at random. The sheets shall first be examined for the requirements given in 4.1, 4.3, 4.4, 4.5 and 4.7 and the n number of test pieces for each of the characteristic as indicated in its test method shall be cut from them. These pieces shall be tested according to the methods specified in Table 1.

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2	cartridge drawing	20	30	80	80	25	10	15	-	300	4.0	3.5
3	cartridge white	17	25	75	80	25	-	-	-	300	4.0	3.5
4	duplicating absorbent / duplicating semi-absorbent	17	25	72	85	25-70	-	-	-	300	4.0	3.5
5	poster machine glazed	17	25	75	-	25	-	-	18 (Glazed side only)	300	4.0	3.5
6	BDS ISO 1924-2	√	√	-	-	-	-	-	-	-	-	-
7	BDS ISO 2470	-	-	√	-	-	-	-	-	-	-	-
8	BDS ISO 2471	-	-	-	√	-	-	-	-	-	-	-
9	BDS ISO 535	-	-	-	-	√	-	-	-	-	-	-
10	BDS ISO 5626	-	--	-	-	-	√	√	-	-	-	-
11	Annex A ISO 8254-1 ISO 8254-2	-	-	-	-	-	-	-	√	-	-	-
12	BDS ISO 8791 (P-2)	-	-	-	-	-	-	-	-	√	-	-
13	BDS ISO 2144	-	-	-	-	-	-	-	-	-	√	√

^{1*} Only for white papers.

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