

**भारतीय मानक**  
**Indian Standard**

**IS 1397 : 2020**

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**पैकिंग और रैपिंग के लिए क्राफ्ट  
कागज़ — विशिष्टि**  
( तीसरा पुनरीक्षण )

**Kraft Paper for Packing and  
Wrapping — Specification**  
( *Third Revision* )

ICS 85.060

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Price Group 4

## Paper and Pulp Based Packaging Materials Sectional Committee, CHD 16

## FOREWORD

This Indian Standard (Third Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Paper Based Packaging Materials Sectional Committee had been approved by the Chemical Division Council.

This standard was first published in 1960. It was later felt that certain additional requirements were necessary for some special end uses. As such, Grade 1 was introduced which satisfied the optional requirements of *pH*, ash, alkalinity, etc, and the standard revised in 1967. The standard was second revised in 1990 in which the kraft paper was classified into three grades, depending upon the use of the raw materials and the end uses.

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* IS 9588 : 1990 Kraft liner — Specification).

In preparing this standard, considerable assistance has been derived from the data made available by the Stationery Office, Government of India, Calcutta and the Forest Research Institute, Dehradun.

In this revision, the title of standard has been modified to give more clarity to content and use of standard. Except change in title, requirements of Cobb value and elongation at break (an optional requirement) have also been modified based on technological developments and needs. Amendments issued so far have been amalgamated.

A scheme for labelling environment friendly products to be known as ECO Mark has been introduced at the instance of the Ministry of Environment, Forests and Climate Change (MoEF&CC). The ECO Mark shall be administered by the Bureau of Indian Standards (BIS) under the *Bureau of Indian Standards Act, 2016* as per the Resolution No. 71 dated 20 February 1991 and No. 425 dated 28 October 1992 published in the Gazette of the Government of India. For a product to be eligible for ECO Mark it shall also carry Standard Mark of BIS for quality, besides meeting additional environment friendly (EF) requirements. For this purpose, the Standard Mark of BIS would be a single mark being a combination of the ISI Mark and the ECO logo. Requirements to be satisfied for a product to qualify for the BIS Standard Mark for ECO friendliness, will be included in the relevant published Indian Standard through an amendment. These requirements will be optional, manufacturing units will be free to opt for the BIS Standard Mark alone also.

This standard was formulated by CHD 16 technical committee. The list of experts who had made significant contribution to the formulation of this standard is given at Annex C.

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 IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

*Indian Standard*

# KRAFT PAPER FOR PACKING AND WRAPPING — SPECIFICATION

( *Third Revision* )

**1 SCOPE**

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

**2 REFERENCES**

The Indian Standards listed in Annex A contain provisions which through reference in this text, constitute provisions of this Indian Standard. At the time of publication, the editions indicated were valid. All standards are subject to revisions, and parties to agreements based on this Indian Standard are encouraged to investigate the possibility of applying the most recent editions of the Indian Standards.

**3 TERMINOLOGY**

For the purpose of this standard, the definitions given in IS 4661: 1991 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**

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 machine glazed 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 Table 1 of IS 1064: 1980. The permissible tolerance on the size shall be in accordance with 4 of IS 1064 : 1980.

**5.4 Substance**

The substance of kraft paper shall be as agreed to between the purchaser and the supplier. A tolerance of  $\pm 5$  percent shall be permitted on the nominal substance when tested in accordance with IS 1060 (Part 5/Sec 5).

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

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**Table 1 Requirements for Kraft Paper**  
( Clauses 5.5 and 8.1 )

SI No.	Characteristic	Requirement			Method of Test
		Grade 1	Grade 2	Grade 3	
(1)	(2)	(3)	(4)	(5)	(6)
i)	Moisture content, percent, <i>Max</i> (as received without conditioning)	9	9	9	IS 1060 ( Part 5 / Sec 2 ) : 2014
ii)	pH, <i>Min</i>	5.5	5.5	5.5	10 of IS 1060 (Part 1) : 1966
iii)	Burst index KPam <sup>2</sup> /g, <i>Min</i>	2.45	1.95	1.50	IS 1060 ( Part 6 / Sec 2 ) : 2014
iv)	Tear index (each direction) mN.m <sup>2</sup> /g, <i>Min</i>	8.80	6.85	4.90	IS 1060 ( Part 6 / Sec 1 ) : 2014
v)	Tensile index N. m/g <i>Min</i>				
	MD	64.0	44.0	29.5	IS 1060 ( Part 5 / Sec 6 ) : 2014
	CD	34.5	24.5	15.5	
vi)	Folding endurance, CD <i>Min</i> ( No. of double folds )				
	60 g/m <sup>2</sup>	30	18	10	IS 1060 ( Part 6 / Sec 3 ) : 2015
	80 g/m <sup>2</sup>	40	25	16	
vii)	Cobb value, 60 sec 27°C				
	Front, <i>Max</i>	30	30	30	IS 1060 ( Part 5 / Sec 4 ) : 2014
	Back, <i>Max</i>	30	30	30	

NOTE: Burst factor = Burst index × 10.2  
Tear factor = Tear index × 10.2  
Breaking length Km = Tensile index × 0.102

**Table 2 Optional Requirements for Kraft Paper, Grade 1**  
( Clauses 5.6 and 8.1 )

SI No.	Characteristic	Requirement	Method of Test
(1)	(2)	(3)	(4)
i)	pH	5.5 to 7.5	10 of IS 1060 (Part 1):1966
ii)	Ash (at 900°C), percent, <i>Max</i>	7.5	IS 1060 ( Part 4 / Sec 3 ) : 2018
iii)	Elongation at break, percent, <i>Min</i>		
	CD	3	IS 1060 ( Part 5 / Sec 6 ) : 2014
	MD	1.3	
iv)	Chlorides ( as NaCl ), percent by weight, <i>Max</i>	0.02	IS 1060 ( Part 4 / Sec 8 ) : 2014
v)	Sulphates ( as Na <sub>2</sub> SO <sub>4</sub> ), percent by weight, <i>Max</i>	0.12	18 of IS 1060 (Part 2) : 1960
vi)	Fatty and/or similar acids ( as C <sub>17</sub> H <sub>33</sub> COOH ), percent by weight, <i>Max</i>	0.25	19 of IS 1060 (Part 2) : 1960
vii)	Alkalinity ( as CaCO <sub>3</sub> ), percent by weight, <i>Max</i>	2.0	Annex B

**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.

**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**.

**5.7.1.2** The manufacturer shall produce to BIS, the environmental consent clearance from the concerned State Pollution Control Board as per the provisions of *Water (Prevention and Control of Pollution) Act, 1974* and *Air (Prevention and Control of Pollution) Act, 1981* along with the authorization, if required under the *Environment (Protection) Act, 1986* and the Rules made thereunder, while applying for ECO Mark

Additionally the manufacturers shall also comply with the provisions under *Prevention of Food Adulteration*

Act, 1954 and the Rules made thereunder wherever necessary.

**5.7.2 Product Specific Requirements**

The paper and paper boards packaging materials shall be manufactured from the following raw materials:

- a) 100 per cent waste paper or agricultural/industrial wastes;
- b) A minimum of 60 per cent by mass of pulp made from materials other than bamboo, hardwood, softwood and reed; and

NOTE — The manufacturer shall provide documentary evidence by the way of certificate or declaration to this effect to Bureau of Indian Standards while applying for Ecomark for requirements under (a) and (b) above.

- c) Paper and paper boards used for packaging of food materials shall be manufactured from virgin pulp and shall be free from dioxins. Printed surfaces of paper shall not come into contact with the food and the maximum amounts of contaminants in paper intended to come into contact with food shall not exceed the limits prescribed in Table 3 when tested according to the methods given in Annex C of IS 3962.

**6 PACKING AND MARKING**

**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 70-75 mm inside diameter and in length corresponding to the width of the paper, with a wooden plug at each end extending to a minimum of 75 mm into the core.

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

**6.3.1 Package**

- 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;
- g) Month and year of manufacture; and
- h) Trade-mark, if any.

**6.3.2 Roll**

- a) Description, substance and grade of the paper;
- b) Length and 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.

**6.4 BIS Certification Marking**

The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act, 2016* and the Rules and Regulations framed thereunder, and the products may be marked with the Standard Mark.

**6.5 Additional Requirements for ECO Mark**

**6.5.1** For ECO Mark, kraft paper shall be packed in such packages which shall be recyclable/reusable or biodegradable.

**6.5.2** The kraft paper may display in brief the criteria based on which the product has been labelled as environment friendly.

**6.5.3** The kraft paper may be sold along with instructions for proper use and mode of safe disposal so as to maximize its performance and minimize wastage.

**6.5.4** It shall be suitably marked on kraft paper that ECO Mark label is applicable only to the packaging material/package if content is not separately covered under the ECO Mark scheme.

**Table 3 Limits of Contaminants in Paper**

( Clause 5.7.2 )

Contaminant	Paper Intended to Come into Contact with Dry Food	Paper Intended to Come into Contact with Wet Food and Food with Fatty Surface	Paper for Filtration
	(mg/kg of paper)	(mg/kg of paper)	(mg/kg of paper)
Cadmium (Cd)	—	0.5	0.5
Chromium (Cr <sup>6+</sup> )	—	0.1	0.1
Lead(Pb)	—	3.0	3.0
Mercury (Hg)	—	0.3	0.3
Pentachlorophenol (PCP)	0.05	0.05	0.05
Polychlorinated biphenyls (PCB <sub>2</sub> )	2.0	2.0	0.5

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NOTE — It may be stated that the ECO Mark is applicable to the product or packaging material or both.

**7 SAMPLING**

**7.1** Representative samples for the test shall be drawn as prescribed in **3** of IS 1060 ( Part 1 ) : 1966.

**7.2 Number of Tests**

Each of the rolls/packages selected from the lot (*see 7.1*) 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.

**7.3 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 8.1*) 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.

**8 TESTS**

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

**8.2 Quality of Reagents**

Unless specified otherwise, pure chemicals and distilled water (*see IS 1070*) 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 2 )

<i>IS No.</i>	<i>Title</i>	<i>IS No.</i>	<i>Title</i>
1060 (Part 1) : 1966	Methods of sampling and test for paper and allied products: Part 1 ( <i>revised</i> )	IS 1060 ( Part 5/Sec 6 ) : 2014	Methods of sampling and test for paper and allied products: Part 5 Methods of test for paper and board, Section 6 Determination of tensile properties — Constant rate of elongation method 20 mm min
1060 (Part 2): 1960	Methods of sampling and test for paper and allied products: Part 2	ISO 1924-2 : 2008	
IS 1060 (Part 4/Sec 3) : 2018	Methods of sampling and test for paper and allied products: Part 4 Methods of test for paper board and pulps, Section 3 Determination of residue ash on ignition at 900 C	IS 1060 ( Part 6/Sec 1 ) : 2014	Methods of sampling and test for paper and allied products: Part 6 Methods of test for paper, Section 1 Determination of tearing resistance — Elmendorf method
IS 1060 (Part 4/Sec 8) : 2014	Methods of sampling and test for paper and allied products: Part 4 Methods of test for paper board and pulp, Section 8 Determination of water soluble chlorides	ISO 1974 : 2012	
ISO 9197 : 2006		IS 1060 ( Part 6/Sec 2 ) : 2014	Methods of sampling and test for paper and allied products: Part 6 Methods of test for paper and allied products: Part 6 Methods of test for paper, Section 2 Determination of bursting strength of paper
IS 1060 (Part 5/Sec 2) : 2014	Methods of sampling and test for paper and allied products: Part 5 Methods of test for paper and board, Section 2 Determination of moisture content of a lot — Oven-drying method	ISO 2758 : 2001	
ISO 287 : 2009		IS 1060 ( Part 6/Sec 3 ) : 2015	Methods of sampling and test for paper and allied products: Part 6 Methods of test for paper and board, Section 3 Determination of folding Endurance of paper
IS 1060 ( Part 5/Sec 4 ) : 2014	Methods of sampling and test for paper and allied products: Part 5 Methods of test for paper and board, Section 4 Determination of water absorptiveness — Cobb method	ISO 5626 : 1993	
ISO 535 : 1991		1064 : 1980	Paper sizes ( <i>second revision</i> )
IS 1060 ( Part 5/Sec 5 ) : 2014	Methods of sampling and test for paper and allied products: Part 5 Methods of test for paper and board, Section 5 Determination of grammage	1070 : 1992	Reagent grade water
ISO 536 : 2012		3962 : 1967	Waxed paper for general packaging
		4661 : 1999	Glossary of terms used in paper trade and industry ( <i>second revision</i> )



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**ANNEX B**

[ Table 2, Item (vii) ]

**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**Alkalinity (asCaCO<sub>3</sub>), percent by mass

$$= \frac{1.250 (A - B) N}{V W}$$

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.



**ANNEX C***( Foreword )***COMMITTEE COMPOSITION**

Experts Who Made Significant Contribution to the Development of this Standard

<i>Organization</i>	<i>Representative(s)</i>
In Personal Capacity	DR N. C. SAHA, ( <b>Chairman</b> ) CHD 16 (EX-DIRECTOR, INDIAN INSTITUTE OF PACKAGING)
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SCIENTIST 'C' (CHD), BIS





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### Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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