

भारतीय मानक मसौदा  
सफ़ेद ठोस सल्फेट बोर्ड — विशिष्टि  
( पहला पुनरीक्षण )

**Draft Indian Standard**  
**Solid Bleached Sulphate Board — Specification**  
( *First Revision* )

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ICS 85.060; 85.080

Paper based packaging materials Sectional  
Committee, CHD 16

**Last date of comments: 15<sup>th</sup> April 2024**

FOREWORD

(*Formal clauses to be added later*)

A range of various board constructions, such as solid bleached sulphate (SBS) boards, in the form of a coherent sheet or web, are used for printing, packaging, decorating etc. They have a lower stiffness ratio to allow more flexibility in carton design and can easily be cut, creased, hot foil stamped and embossed. These boards possess a consistent bright appearance, are resistant to fading and have excellent printability. Being hygienic and with no smell and taste, make them usable for packaging aroma and flavour sensitive products such as food, chocolate, cigarettes, pharmaceuticals and cosmetics. These boards are also used for computerized printings, retail packaging, high impact graphic corrugated containers, folding carton boards and other consumable items.

In view of fast emerging market of SBS boards and entry of different national and international manufacturers in this field, coupled with technological developments, the need to outline a standard for the product was felt. In the absence of any existing standard, data from different manufacturers on extensive study of different parameters desirable by the consumers were considered while preparing this standard.

This standard is intended to define the quality of SBS board to assure supply of proper quality of such boards to consumers. It is expected that this standard would help manufacturers and consumers to communicate from a single platform, especially for those who prefer to adhere with a pre-defined standard for procurement as per need of their requirements. It is also expected that this standard will assist the manufacturers to control the quality of their products and the consumers to obtain material of proper quality.

This standard was first published in 2018 taking considerable assistance from the data made available by various organizations like JK Paper, ITC, Century Paper, Divya Shakti, Siddarth, Khanna, Murali Agro, Rainbow, etc, and PAPRI, where a number of tests were carried out for the purpose.

In this first revision, the following changes have been made:

- a) Amendment 1 has been amalgamated;
- b) Reference clause has been updated;
- c) Construction clause has been modified;
- d) New requirement and method of test for Print resistance and ink adhesion of printed cartons has been incorporated;
- e) Cobb 60 Second requirement has been removed;
- f) Requirements for thickness, grammage, bulk, moisture, Stiffness, brightness, gloss, IGT dry pick and roughness have been updated;
- g) Bendtsen smoothness requirement has been specified for material when bottom is coated or uncoated, and
- h) The optional requirement for ECO mark has been deleted.

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: 2022 'Rules for rounding off numerical values (*second revision*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

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**Solid Bleached Sulphate Board — Specification**  
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**1 SCOPE**

This standard prescribes the requirements and methods of sampling and test for solid bleached sulphate (SBS) board.

**2 REFERENCES**

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

**3 TERMINOLOGY**

For the purpose of this standard, the definitions given in IS 4661 shall apply, in addition to the following:

**3.1 SBS Board**

This is solid bleached sulphate (SBS) board made of bleached virgin fibre grade of wood pulp. It is a medium density board and is perfectly white, both inside and out.

**3.2 Chrome Paper**

A paper or board coated on one side with material containing adhesive, china clay (Kaolin) etc. The coating on one side could be glossy or matt as per requirement of the customer. Used mainly for self-adhesive stickers, calendars, posters, labels and for application where only one side has to be printed.

**3.3 Mixed Waste Board**

Pieces of board that may be reclaimed after use or from a converting process for re-pulping and making again into board.

**3.4 Intermittent Machine**

A machine for forming sheets of board. It consists of either a fourdrinier former or one or more-cylinder moulds or vats. The wet web is wound on a drum forming a continuous mat of several layers.

**3.5 Delamination or Interlaminar Strength**

Delamination strength or interlaminar strength is usually defined by a number of methods designed to measure the force or energy required to separate or delaminate the interior structure of paperboard, that is, the bonding within or between the plies, not the interface between the fibres and coating or within the coating itself.

**3.6 Interlayer Strength, Ply-bond**

As a multi-ply paperboard is built from several layers of fibres, it is important that these layers are well bonded together. Interlayer strength is the expression used to quantify this property. By ply-bond test, the energy needed to delaminate a sample by applying a perpendicular force to the paperboard surface is quantified. The test result is expressed in J/m<sup>2</sup>.

**4 CONSTRUCTION**

The construction of solid bleached sulphate board shall be as given below:

- a) Top coating: The coating grammage (Combined Pre-coat and Post-coat) shall be  $20 \pm 6$  gsm;
- b) Top liner: It shall be from virgin chemical pulp;
- c) Fillers: It may be from 60 percent virgin chemical Pulp and 40 percent specialized customized pulp or as suitable for board application;
- d) Back liner: It shall be from virgin chemical pulp, and
- e) Bottom coating: It may be of 6 to 10 gsm, but it is optional based on customer requirements.

## **5 REQUIREMENTS**

The boards shall be uniform in thickness and shall lie flat and be dimensionally stable. Both sides of the board shall be clean and free from loosely bound fibres, holes, hard spots and lumps. The printing surface shall be smooth, of even finish, formation, absorbency and colour. The surface liner shall be opaque and free from patchy finish.

### **5.1 General**

#### **5.1.1 Slitting and Cutting**

Sheets shall be cut cleanly and square to specified dimensions. Reels shall be evenly wound. All cut edges shall be free from loose fibres and dust.

### **5.2 Squareness**

The tolerance on Squareness shall be such that the shorter diagonal of the sheet shall not differ from the longer by more than one percent of the former.

### **5.3 Thickness**

Normally the thickness for solid bleached sulphate board is between 270 to 750 micron. However, the thickness of SBS board other than these shall be as agreed to between the buyer and the supplier. A tolerance of  $\pm 5$  percent shall be allowed on the average thickness when tested in accordance with IS 1060 (Part 5/Sec 3).

### **5.4 Grammage**

Normally, the grammage for SBS board is between 200 to 450 gsm. However, the nominal grammage of SBS board other than this shall be as agreed to between the purchaser and the supplier. A tolerance of  $\pm 5$  percent for individual test results and  $\pm 3$  percent for the average of 10 test results shall be allowed on the nominal grammage, when tested in accordance with IS 1060 (Part 5/Sec 5).

### **5.5 Sizes**

The sizes of the board shall be as agreed to between the buyer and the supplier. The tolerance on the sizes shall be maximum of 1 mm when tested in accordance with 1060 (Part 5/Sec 3).

### **5.6 Print resistance and ink adhesion of printed cartons**

The material shall pass for the print resistance and ink adhesion when tested in accordance with the **Annex B** and **Annex C** of this standard.

### **5.7 Stiffness [Bending Resistance]**

The average Taber stiffness value for different grammage of board shall be as given in **Table 1** and **Table 2**, and shall be determined for machine direction (MD) and cross direction (CD) by the method prescribed in TAPPI T-556. The tolerance on mean value shall be within  $\pm 10$  percent for both MD and CD. The ratio of MD to CD (MD/CD) shall be between 1.8 and 2.4 for all grammage.

### **5.8 Strength**

**5.8.1** The board shall be stiff, shall not easily delaminate, and after being properly creased, shall fold neatly at 180° without cracking.

**5.8.2** The value of delamination, in terms of internal bond strength, shall not be less than 36 g/cm when tested by the method prescribed in **Annex B**.

**5.9** The board shall also comply the requirements given in **Table 1**.

**Table 1 Requirement for Solid Bleached Sulphate Boards**

(Clause 5.7, 5.9 and 7.2)

Sl. No. (1)	Characteristic (2)	Requirements (3)		Method of Tests, Ref to (4)
i)	Bulk, cc/g	1.100 – 1.155 (Ref. clause 5.3)		IS 1060 (Part 5/Sec 3)
ii)	Moisture, percent	6.0 to 9.0		IS 1060 (Part 5/Sec 2)
iii)	Stiffness (Bending Resistance, L&W, mN	MD Tolerance $\pm 15\%$	CD Tolerance $\pm 15\%$	TAPPI T-556
	200 gsm	90	45	
	250 gsm	160	80	
	300 gsm	250	130	
	350 gsm	400	200	
	400 gsm	540	270	
	450 gsm	720	372	
iv)	Brightness, indoor C/2°, percent, <i>Min</i>	88		IS/ISO 2470-1
v)	Gloss 75°, percent, <i>Min</i>	35		IS 1060 (Part 5/Sec 12)
vi)	Ply Bond Strength, J/m <sup>2</sup> · <i>Min</i>	130		T-569 pm-00
vii)	IGT dry pick, m/s, <i>Min</i>	1.0		1060 (Part 5/Sec 9)
viii)	Roughness (pps), <i>Max</i>	2.2		1060 (Part 5/Sec 17)

### 5.10 Optional Requirements

**5.10.1** When agreed to between purchaser and the supplier, the board shall also comply with the requirements given in **Table 2**.

**Table 2 Optional Requirements for SBS board**

(Clause 5.7 and 5.10.1)

Sl. No (1)	Characteristic (2)	Requirements (3)	Method of Tests, Ref to (4)
i)	Surface pH	Declared value $\pm 0.1$	IS 1060 (Part 3)

ii)	Burst Factor, kg/cm <sup>2</sup> , <i>Min</i>	15	IS 1060 (Part 7/Sec 1)
iii)	Wax pick number	No pick at 14A	IS 1060 (Part 3)
iv)	Surface oil absorbency test (SOAT), sec	600 ± 5	IS 1060 (Part 1)
v)	Bendtsen smoothness, ml/min, <i>Max</i>		IS 1060 (Part 5/Sec 20)
	Top side	50	
	Back side		
	If Bottom side is coated	500	
	If bottom side is uncoated	1000	
vi)	Water soluble chlorides (as sodium chloride (NaCl)), percent by mass, <i>Max</i>	0.08	IS 1060 (Part 4/Sec 8)
vii)	Water soluble sulphate (as sodium sulphate (Na <sub>2</sub> SO <sub>4</sub> )), percent by mass, <i>Max</i>	0.25	IS 1060 (Part 4/Sec 9)
viii)	Fatty and/or similar acids (as C <sub>17</sub> H <sub>33</sub> COOH), percent by mass, <i>Max</i>	0.25	IS 1060 (Part 2)

**5.10.2 When used in food packaging:**

Paper and paper boards used for packaging of consumer packaging shall be manufactured from virgin pulp and shall be free from dioxins & Furans (<1ppb, measured as per USEPA 1613), if it is used for Food Packaging. 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.

**Table 3 Limits of Contaminants in Paper**

(Clause 5.10.2)

Sl. No	Contaminant	Paper Intended to Come into Contact with Dry Food (mg/kg of Paper)	Paper Intended to Come into Contact with Wet Food and Food with Fatty Surface (mg/kg of Paper)	Paper for Filtration (mg/kg of Paper)
(1)	(2)	(3)	(4)	(5)
i)	Cadmium (Cd)	—	0.5	0.5
ii)	Chromium (Cr <sup>6+</sup> )	—	0.1	0.1
iii)	Lead (Pb)	—	3.0	3.0
iv)	Mercury (Hg)	—	0.3	0.3
v)	Pentachlorophenol (PCP)	0.05	0.05	0.05
vi)	Polychlorinated biphenyls (PCBs)	2.0	2.0	0.5

**6 PACKING AND MARKING****6.1 Packing**

The boards shall be securely and suitably packed as agreed to between the buyer and the supplier

**6.2 Marking**

**6.2.1** Each package shall be marked with the following particulars:

- a) Description of the material;
- b) Size of the board;
- c) Net mass of contents;
- d) Batch number;
- e) Date of manufacture; and
- f) Manufacturer's name and/or recognized trade name.

### 6.2.2 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 there under, and the products may be marked with the Standard Mark.

## 7 SAMPLING AND CRITERIA FOR CONFORMITY

**7.1** The boards shall be sampled in accordance with **4** of IS 1060 (Part 1).

### 7.2 Tests

From each of the packets, selected from the lot, the board shall be taken out at random. These boards shall constitute the sample. The boards selected shall be tested for requirement given in **5.1** to **5.5**. One test piece shall be cut from each selected board and tested for each of the characteristics prescribed in **5.6** to **5.8** and **Table 1**. Individual sample of board not meeting the requirements for any one or more characteristics shall be considered as defective.

### 7.3 Criterion for Conformity

A lot shall be declared as conforming to all the requirements of this specification if the number of defective boards found does not exceed the acceptance number. The acceptance number shall depend upon the size of the sample (*see 7.2*) and shall be zero if the size of the sample is less than 13 and one if it is greater than or equal to 13.

## ANNEX A

(Clause 2)

### LIST OF REFERRED INDIAN STANDARDS

<i>IS No.</i>	<i>Title</i>
IS 1060	Methods of Sampling and Test for Paper and Allied Products
(Part 1) : 2022	Part 1 Test Methods for General Purpose ( <i>second revision</i> )
(Part 2) : 1960	Methods of sampling and test for paper and allied products, Part 2
(Part 3) : 1969	Methods of sampling and test for paper and allied products, Part 3
(Part 4)	Methods of test for paper, board and pulps
(Sec 8) : 2014	Determination of water soluble chlorides
(Sec 9) : 2014	Determination of water soluble sulphate
(Part 5)	Methods of Test for Paper and Board
(Sec 2) : 2021	Determination of moisture content of a lot Oven-drying method ( <i>first revision</i> )
(Sec 3) : 2014	Determination of thickness, density and specific volume
(Sec 5) : 2021	Determination of grammage ( <i>first revision</i> )

(Sec 9) : 2014	Determination of resistance to picking — Accelerated speed method using the IGT-type tester (electric model)
(Sec 12) : 2014	Measurement of specular gloss — 75 degree gloss with a converging beam, TAPPI method ( <i>first revision</i> )
(Sec 17) : 2014	Determination of roughness/smoothness (Air leak methods) — Print-surf method
(Sec 20) : 2018	Determination of roughness/smoothness (Air leak methods) — Bendtsen method
(Part 7/Sec 1) : 2014	Methods of test for board: Sec 1 determination of bursting strength of board
IS/ISO 2470-1 : 2009	Paper, board and pulps — Measurement of diffuse blue reflectance factor: Part 1 Indoor daylight conditions (ISO brightness)
IS 3962 : 1967	Waxed paper for general packaging
IS 4658 : 2019	Specification for coated paper and board (Art And Chromo) ( <i>second revision</i> )
IS 4661 : 1999	Glossary of terms used in paper trade and industry ( <i>second revision</i> )

## ANNEX B

(Clause 5.6 and 5.8.2)

### TEST FOR PRINT RESISTANCE OF PRINTED CARTONS

**B-1** Leave the paper based multilayer laminated/extruded composite cartons to stand for at least 24 h after printing.

**B-2** Smear the paper based multilayer laminated/ extruded composite cartons, or representative section cut from the printed area with liquid food intended to be packed in at ambient conditions and leave it for 1 h.

**B-3** Wash the paper based multilayer laminated/extruded composite cartons or its representative section with cold water.

**B-4** Rub each paper based multilayer laminated/ extruded composite carton or representative section firmly with hard paper tissue ten times.

**B-5** There shall be no significant removal of the print from the surface of the paper based multilayer laminated/extruded composite carton and the print shall be legible to the naked eye after the test

## ANNEX C

(Clause 5.6)

### TEST FOR INK ADHESION OF PRINTED CARTONS

**C-1** Apply two strips of 25 mm wide transparent pressure sensitive taps or cello-tape to the printed area of the paper based multilayer laminated/extruded composite carton. One piece down the length of the carton and the other along the width.

**C-2** Press the tape firmly on to the paper based multilayer laminated/extruded composite carton and leave for 15 s.

**C-3** Remove the tape by pulling slowly at about 10 mm/s from one end at about 90° to the paper based multilayer laminated/extruded composite carton surface.

**C-4** There shall be no significant removal of the print from the surface of the paper based multilayer laminated/extruded composite carton and the printed material shall be still legible



**DRAFT FOR COMMENTS ONLY**

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