भारतीय मानक मसौदा

खाद्य और पेय वितरण और सेवा अनुप्रयोगों के लिए पेपर-आधारित सामग्री — विशिष्टि

Draft Indian Standard

Paper-Based Materials for Food & Beverage Delivery and Serving Applications — Specification

ICS 85.060;85.080

Paper based packaging materials Sectional Committee, CHD 16	Last date of comments: 30th December 2024

FOREWORD

(*formal clause will be added later*)

Delivery and serving of food and beverages play a critical role in food safety. It is therefore essential that the materials used for delivery and serving of food and beverages are safe and do not interact with the food and beverage items. Traditionally, metal and glass have been used for this purpose to ensure safety of food and beverages. Considering the heaviness and special care required for metal and glass items as well as the economic considerations and functional properties, plastic-based delivery and serving materials gained popularity. The inert nature of plastic and issues related to collection and recycling of lower thickness plastic materials have led to rampant littering. The society is therefore becoming cautious about its impact on the environment and to human and animal life. This has led Ministry of Environment, Forest and Climate Change, government of India bringing legislation fixing responsibilities of the producers.

Given these factors, paper-based materials for such delivery and serving applications are slowly gaining ground. The committee responsible for development of standards on paper-based packaging therefore decided to formulate a standard on paper /paperboard-based barrier coated/materials (where the barrier is applied by Coating/ Extrusion/ Lamination) used for delivering or serving food and beverages. The intention is to define the quality of such materials so as to help industry in making quality products and to ensure food and beverages remain safe for human consumption. This standard can apply to both direct and indirect food contact materials which may be printed/ unprinted and in the shape of a wrap, cover, bag, pouch, carton box, clamshell, plates, trays, cups or bowls intended to be used for serving or delivery containers and not for storage.

During the development of this standard, the committee has also considered national and international standards on the subject and has drawn considerable assistance from the following standards:

a) IS 1776 : 1989 Folding box board, uncoated — Specification (*first revision*)

b) IS 9845 : 1998 Determination of overall migration of constituents of plastics materials and articles intended to come in contact with foodstuffs — Method of analysis (*second revision*)

c) USA FDA and BFR EU 10/2011 BfR Recommendations on Food Contact Materials

d) IS/ISO 17088 : 2021 Compostable plastics — Specification (*second revision*)

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.

Draft Indian Standard

PAPER-BASED MATERIALS FOR FOOD AND BEVERAGE DELIVERY AND SERVING APPLICATIONS — SPECIFICATION

1 SCOPE

This standard prescribes requirements, methods of sampling and tests for paper and paperboard-based barrier coated substrates for food & beverage delivery & serving applications.

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 edition of these standards.

3 TERMINOLOGY

For the purpose of this standard, the definitions given in IS 4261 and IS 2828 shall apply, in addition to the following:

3.1 Food Grade Material

The material made of substances which are safe and suitable for their intended use and shall not endanger human health or result in unacceptable change in the composition of the food or organoleptic characteristics when in direct/ indirect contact with the packaging material.

3.2 Overall Migration Limit

The maximum permitted amount of non-volatile substances like monomer, additives, pigments etc. leached or migrated from a packaging material or article into the food.

3.3 Specific Migration Limit

The maximum permissible amount of heavy metals like, Barium (Br), Cobalt (Co), Copper (Cu), Iron (Fe), Lithium (Li), Manganese (Mn), Zinc (Zn), Antimony and Phthalic acid, (2-ethylehexyl) ester (DEHP) which has got hazardous effect to human health, leaches or migrated from packaging material into food products.

4 MATERIALS AND CONSTRUCTION

4.1 Paper/ Paper board

4.1.1 The paper/ paper board used for manufacturing the material shall be made from Virgin Pulp only.

4.1.2 The paper/ paper board used for manufacturing containers like cups/ bowls/ tubs for beverages shall be free from OBA (Optical Brightening Agents). To check for the presence of OBAs, the brightness of material shall be measured using a UV Spectrophotometer. The difference in brightness (percent) between visible spectrum and UV Spectrum determined through UV Spectrophotometer shall not exceed 1 percent.

4.2 Coating/ barrier material

4.2.1 The coating material shall be:

a) Bio polymers (PLA/PBS/ PHA/ or a blend made out of such bio polymers); and

b) Water/Solvent Based Emulsions or a blend.

5 REQUIREMENTS

5.1 Description

The material shall be uniform in texture, finish, free from pin-holes, streaks, tears, blisters and particulates of foreign matter. The material shall show no impression of handling on the surface of the sheet and shall have even and wrinkle-free surface. The material shall be free from any extraneous odour.

5.2 When supplied in reel/ bobbin/ sheet form:

5.2.1 The reel/ bobbin/ sheet shall confirm to IS 9845 for permissible limits of migration of 10 mg/kg for different food products for test durations less than 24 h.

5.2.2 The reel/ bobbin/ sheet shall be compostable when tested in accordance with IS/ISO 17088.

5.2.3 The reel/ bobbin/ sheet shall be re-pulpable with at least 90 percent by weight of fibre recovery for grammage up to 150 gsm and with 95 percent by weight of fibre recovery for grammage of 151 gsm and above as tested by the Central Pulp & Paper Research Institute, Saharanpur, India.

5.3 Finished containers

5.3.1 The finished materials shall confirm to the requirement given at 5.2.

5.3.2 *Over-all Migration*

The material layer which will come in contact with food/beverage shall be subjected to over-all migration test as per IS 9845 for time conditions less than 24 h. The over-all migration by the material layer shall be less 60 mg/kg or 10 mg/dm^2 when tested as per method specified in IS 9845 with no visible colour migration.

5.3.3 *Specific Migration Test*

5.3.3.1 Paper based materials shall not release heavy metal substances in contact with food/beverages in quantities exceeding the specific migration limits specified in Table 1 when test according to the methods mentioned at col (4) of the Table 1.

Table 1 Limits for Specific Migration
(*Clauses* 5.3.3.1 and 5.3.3.2)

Sl. No.	**Substances**	**Migration Limit (mg/Kg), *Max***	**Methods of Test, Ref to**
(1)	(2)	(3)	(4)
i)	Barium	1.0	IS 3025 (Part 2)
ii)	Cobalt	0.05	IS 3025 (Part 2)
iii)	Copper	5.0	IS 3025 (Part 2)
iv)	Iron	48.0	IS 3025 (Part 2)
v)	Lithium	0.6	IS 3025 (Part 2)
vi)	Manganese	0.6	IS 3025 (Part 2)
vii)	Zinc	25.0	IS 3025 (Part 2)
viii)	Antimony	0.04	IS 3025 (Part 2)
ix)	Polychlorinated biphenyl (PCB)	2.0	IS 1776
x)	Phthalic acid	1.5	IS 9873 (Part 6)

5.3.3.2 The sample shall be prepared using the procedure described in IS 9845, for toxic substances mentioned at Sl. No. i) to viii) of Table 1.

5.3.4 *Edge Wick Test*

The absorption by the edge of beverages containers such as cups/ bowls/ tubs shall not exceed 1.4 kg/m^2 when tested as per Annex B.

6 PACKING AND MARKING

6.1 Packaging

The paper-based barrier coated /laminated /extruded materials shall be packed securely and suitably to protect from any extraneous dust or contamination hazards as agreed to between the purchaser and supplier.

6.2 Marking

6.2.1 Each package shall be marked as per the requirements of the *Food Safety (Standards) Packaging Regulations*, 2020 and the *Food Safety (Standards) Labelling Regulations*, 2019, and the *Legal Metrology Act*, 2009 and the rules framed thereunder.

6.2.2 Each reel/ sheet/ bobbin intended for conversion for food & beverage delivery or serving shall be marked with following details:

a) Indication of the source of manufacture;

b) Batch number;

c) Date of manufacture; and

d) Claim of compostability must be backed by CPCB Registration No. and approved QR Code.

6.2.3 *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.

ANNEX A

(*Clause* 2)

LIST OF REFERRED STANDARDS

IS No.	*Title*
IS 1776 : 1989	Folding Box Board, Uncoated — Specification (*first revision*)
IS 4261 : 2001	Glossary of Terms Relating to Paper and Pulp Based Packaging Materials (*first revision*)
IS 2828 : 2019 /ISO 472 : 2013	Plastics — Vocabulary (*second revision*)
IS 3025 (Part 2) : 2019 /ISO 11885 : 2007	Methods of Sampling and Test (Physical and Chemical) for Water and Wastewater: Part 2 Determination of Selected Elements by Inductively Coupled Plasma Optical Emission Spectrometry (ICP-OES) (*first revision*)
IS 9873 (Part 6) : 2021 /ISO 8124-6 : 2018	Safety of Toys: Part 6 Determination of Certain Phthalate Esters in Toys and Children's Products (*first revision*)
IS 9845 : 1998	Determination of overall migration of constituents of plastics materials and articles intended to come in contact with foodstuffs — Method of analysis (*second revision*)
IS/ISO 17088 : 2021	Compostable Plastics — Specification (*second revision*)

ANNEX B

(*Clause* 5.3.4)

EDGEWICK TEST METHOD

B-1 DEFINITION

The edge wick index is defined as the amount of test solution absorbed through the edges of test pieces under specified testing condition.

B-2 PROCEDURE

Apply or fix food grade transparent tape on test sheet. Cut 5 test pieces of size 25 mm (MD) x 75 mm (CD) from sample sheet. Weigh the test pieces together (in mg). Pour fresh 1 percent lactic acid in a vessel (level 10 mm ± 1 mm). Place the test pieces in the vessel and note the time. Remove the test pieces after 60 min ± 2 min. Place the test pieces between two blotting papers to the dry surface. Weigh the test pieces together in mg. Calculate the absorbed liquid weight in mg.

B-3 REPORT

The average reading is reported in kg/m²/h.