



www.bis.gov.in

उत्पाद मैनुअल

**Paper based Multilayer Laminated/Extruded Composite Cartons
(Aseptic and Non-Aseptic) for Processed
Liquid Food Products and Beverages
IS 17753: 2021 के अनुसार**

**PRODUCT MANUAL
FOR Paper based Multilayer Laminated/Extruded Composite Cartons
(Aseptic and Non-Aseptic) for Processed
Liquid Food Products and Beverages
According to IS 17753: 2021**

विभिन्न उत्पादों के लिए भारतीय मानक ब्यूरो (अनुरूपता मूल्यांकन) विनियम, 2018 की योजना -I के तहत प्रमाणन के संचालन में एकरूपता और पारदर्शिता के लिए इस उत्पाद मैनुअल का उपयोग सभी क्षेत्रीय / शाखा कार्यालयों और लाइसेंसधारियों द्वारा संदर्भ सामग्री के रूप में किया जाएगा। दस्तावेज़ का उपयोग बीआईएस प्रमाणन प्राप्त करने के इच्छुक संभावित आवेदकों द्वारा भी किया जा सकता है।

This Product Manual shall be used as reference material by all Regional/Branch Offices & licensees to ensure uniformity of practice and transparency in operation of certification under Scheme-I of Bureau of Indian Standards (Conformity Assessment) Regulations, 2018 for various products. The document may also be used by prospective applicants desirous of obtaining BIS certification.

1.	मानक संख्या IS No.	:	IS 17753:2021
	शीर्षक Title	:	Paper based Multilayer Laminated/Extruded Composite Cartons (Aseptic and Non-Aseptic) for Processed Liquid Food Products and Beverages-Specification
	संशोधनों की संख्या No. of amendments	:	04
2.	नमूना दिशानिर्देश Sampling Guidelines		
a)	कच्चा माल Raw material	:	Paper Board as per Cl – 4.1 and 4.1.1 Polyethylene as per Cl- 4.1 and 4.1.2 Aluminum Foil as per Cl- 4.1 and 4.1.3 Caps as per Cl 4.1.4 Drinking Straws as per Cl. 4.1.5 Declaration by manufacturer for paper board been made from virgin material

			Note: This section indicates the requirements for raw material(if specified in the IS)for which compliance is to be established during Grant of Licence/Change in Scope of Licence/Factory Surveillance.
b)	समूहीकरण दिशानिर्देश Grouping Guidelines	:	Each Type, Number of layers/ply, shelf life and Barrier of Paperbased Multilayer Laminated/Extruded Composite sheet/Cartons shall be tested to be covered in the scope of license
c)	नमूने का परिमाण Sample Quantity	:	5 Meter laminated Sheet (Full width), 11 Nos of A4 size Paper Board Sheet, 10 Nos A4 size aluminum Sheet (500 grams approx.), 10 Nos A4 size PE Sheet/film of both side of the sheet (if outer surface is also laminated) Appropriate quantity of containers with total exposed area of 2000 cm², (for migration test) 20 filled containers. (for vibration test) Sheets/reel (preferably cut in circular form of 90 mm dia) and packed in aseptic condition shall be sent for microbiological testing Note: This section indicates the quantity of the sample of the product and/or the raw material (if applicable), required to be sent to the laboratory for testing, for the purpose of Grant of Licence/Change in Scope of Licence/ Factory Surveillance (in case of market surveillance, effort may be made to procure the required quantity of product sample, as far as possible since raw material sample may not be available in market)
d)	परीक्षण अनुरोध में घोषित किए जाने वाले पैरामीटर Parameters to be Declared in Test Request	:	i) Type ii) shelf life iii) Number of layers/ply iv) Classification of foods as per IS 9845 v) Barrier Note: Apart from the above, any other requirements/parameters may also be declared as per the standard, as applicable.
3.	परीक्षण उपकरणों की सूची List of Test Equipment	:	Please refer to Annex-A
4.	निरीक्षण और परीक्षण की स्कीम Scheme of Inspection and Testing	:	Please refer to Annex-B
5.	एक दिन में संभावित परीक्षण Possible tests in a day		

	a) Construction (Cl. 4.1) b) Description (Cl. 5.1) c) Grammage of paperboard (4.1, Table 1) d) Thickness of Aluminum Foil (4.1, Table 1) e) Thickness of Polyethylene (4.1, Table 1) f) Capacity (4.3) g) Over-all Migration (5.2.1) h) Specific Migration (5.2.2) i) Vibration Leakage Test (5.2.3) j) Print Resistance Test (5.2.6) k) Ink Adhesion test (5.2.7) Note: This section is for the guidance of BIS Certification Officers/Technical Auditors of BIS Authorized Outside Surveillance Agencies(OSAs) during factory inspection to provide ready reference regarding the tests which can be witnessed during the inspection in the factory by the officer/auditor.										
6.	लाइसेंस का दायरा/Scope of the Licence:										
	IS 17753: 2021 के अनुसार मानक मुहर का उपयोग करने के लिए लाइसेंस निम्नलिखित कार्यक्षेत्र के लिए प्रदान किया जाता है "Licence is granted to use Standard Mark as per IS 17753: 2021 with the following scope:										
	<table border="1"> <tr> <td>Name of the product</td><td>Paper based Multilayer Laminated/Extruded Composite Cartons (Aseptic and Non-Aseptic) for Processed Liquid Food Products and Beverages</td></tr> <tr> <td>Type</td><td>Paper based Multilayer Laminated/Extruded Composite Sheets/Cartons (Aseptic and/or Non-Aseptic)</td></tr> <tr> <td>shelf life</td><td>To be declared</td></tr> <tr> <td>Number of layers/ply</td><td>3-ply or 5-ply or 6-ply</td></tr> <tr> <td>Barrier</td><td> a) paper based multilayer laminated/extruded composite sheet with aluminium foil based barrier, and/or b) other than paper based multilayer laminated/extruded composite sheet with aluminium foil based barrier </td></tr> </table>	Name of the product	Paper based Multilayer Laminated/Extruded Composite Cartons (Aseptic and Non-Aseptic) for Processed Liquid Food Products and Beverages	Type	Paper based Multilayer Laminated/Extruded Composite Sheets/Cartons (Aseptic and/or Non-Aseptic)	shelf life	To be declared	Number of layers/ply	3-ply or 5-ply or 6-ply	Barrier	a) paper based multilayer laminated/extruded composite sheet with aluminium foil based barrier, and/or b) other than paper based multilayer laminated/extruded composite sheet with aluminium foil based barrier
Name of the product	Paper based Multilayer Laminated/Extruded Composite Cartons (Aseptic and Non-Aseptic) for Processed Liquid Food Products and Beverages										
Type	Paper based Multilayer Laminated/Extruded Composite Sheets/Cartons (Aseptic and/or Non-Aseptic)										
shelf life	To be declared										
Number of layers/ply	3-ply or 5-ply or 6-ply										
Barrier	a) paper based multilayer laminated/extruded composite sheet with aluminium foil based barrier, and/or b) other than paper based multilayer laminated/extruded composite sheet with aluminium foil based barrier										

ANNEX–A

LIST OF TEST EQUIPMENTS

(INDICATIVE LIST, FOR GUIDANCE ONLY)

Sl. No.	Tests used in with Clause reference	Test Equipment
1.	Components of Composite sheet (Cl. 4.1, Table 1)	Cutting device, Weighing Balance, Conditioning chamber, Special sheet-weighing balances, arrangement to carry out test at standard atmospheric conditions
2.	Thickness (of Aluminum foil)	metal template with beveled edges sharp knife, cleaning Solvent, oven
3.	Thickness (of Polyethylene)	dead weight dial micrometer with a flat anvil/spring dial micrometer (dial thickness gauge), stop watch, scale
4.	Capacity(Cl. 4.3)	Volumetric Flasks, Measuring Cylinders or Beakers of Various capacities as per requirement
5.	Description(Cl. 5.1)	An inspection table with sufficient illumination
6	Overall Migration (Cl 5.2.1)	(i)Electric oven/Water bath equipped with temperature controller to maintain desired temperature up to $\pm 1^{\circ}\text{C}$ accuracy ii) Electric hot plate with temperature control regulator iii) Weighing balance with a sensitivity of 0.1mg iv) Beaker v) Evaporating Dish vi) Suitable scale /caliper to measure dimensions
7.	Specific Migration test (Cl 5.2.2)	Electric oven/water bath equipped with thermostat, Electric hot plate with temperature control regulator, Analytical balance, Glass beakers, Stainless steel evaporating dish, Stainless steel tongs, Desiccator ICP-OES as per IS 3025(Part 2), Water, Nitric acid, Sulfuric acid, Hydrochloric acid, Hydrochloric acid, certified Reference material. Standard stock solutions Dichloromethane, Phthalate reference substances, Stock solution, External standard (ES) calibration solutions, Internal standard (IS) calibration solutions, Normal laboratory glassware, Gas chromatography-mass spectrometer (GC-MS), Soxhlet extractor, Solvent extractor, Extraction thimble, Cotton wool, Analytical balance, Concentration apparatus, Solid phase extraction (SPE) cartridge, Volumetric flasks, Pipettes, Polytetrafluoroethylene (PTFE) membrane filter, Ultrasonic bath, Ultrasonic basket, Airtight glass reaction vessel, Centrifuge, water bath For Phthalic Acid- Phthalic Acid, Ethyl Methyl Ketone, Bromophenol Blue Indicator Standard Triethylamine Solution (in Ethyl Methyl Ketone) Weighing Balance 0.1g LC Hotplate as per A-4 of IS 5158

	Vibration Leakage Test , cl 5.2.3	Vibration Table Conforming to IS 7028 (Part 2), Conditioning Chamber, blotting paper
8	Shelf Life test(Microbiological Parameters, Table 4), Cl 5.2.4	Conditioning Chamber, As per ISO 8784(Part 1) - Plate Count Agar or Tryptone Glucose Extract Agar, Ringer's Solution or other isotonic solutions, Tween 80 and Autoclave, Suitable wrapping material, e.g. aluminium foil (non-coated and inert), ready- to-use envelopes of different sizes or self-closing plastic bags, Disintegrator, Incubator, Petri Dishes, Pipettes, Water Bath, Colony-counting equipment or magnifying device, Balance, Sterilizing unit (autoclave), laminar flow chamber As per ISO 8784(Part 2) - Sabouraud 4 % Dextrose Agar (SDA) with chloramphenicol, RODAC contact plates, Aluminium foil, Incubator, Petri dishes, Pair of stainless- steel scissors, Gauge, Forceps or tweezers, Colony counting equipment, Weight, of mass 500 g, laminar flow chamber
9	Water Vapour Transmission Rate(WVTR) (Clause 5.2.5.1)	<u>Annex C of IS 17753</u> Apparatus as per Annex C of IS 17753(C-5.1 to C-5.5), Conditioning Chamber, Or <u>As per IS 17846</u> Test dishes, Lids, Waxing templates(cross-braced ring templates or cover templates), Sealant, Water Bath, Device for distributing the wax, Cutting template or test piece cutter, Desiccant, Balance(L.C.- 0.1mg), tongs and enclosure.
10	Oxygen Transmission Test (OTR) (Clause 5.2.5.1)	Conditioning chamber, desiccator with desiccant, arrangement to carry out test at test temperature. Apparatus as per Cl 7 of IS 13360 (Part 8/Sec 6/Subsec 2) ISO 15105-2 (temperature regulated chamber or room, Gas-Transmission Cell), Coulometric Sensor, Gas Conditioning Devices, Flow meters, Test Gas, Oxygen Gas
11	Print Resistance Test (Clause 5.2.6)	Cold Water, Hard Paper Tissue,
12	Ink Adhesion test (Clause 5.2.7)	Transparent pressure sensitive taps or cello-tape, Stop Watch, arrangement for pulling tape slowly at about 10 mm/s from one end at about 90° to the paper

Annex B

SCHEME OF INSPECTION AND TESTING

1. QUALITY ASSURANCE PLAN

1.1 It is expected that during operation of BIS licence, manufacturers will implement a Quality Assurance Plan (QAP) i.e. a plan of regular testing and in-process controls, designed to ensure that the product bearing the Standard Mark conforms to all requirements of the Indian Standard.

1.2 The manufacturers shall define a Quality Assurance Plan (QAP) defining the control unit (i.e. lot/batch etc.), the levels of control (i.e. the frequency and number of samples for conducting the different tests as per the Indian Standard) and declare the arrangement for testing i.e. whether in-house or subcontracting/sharing for each applicable test and submit the same to BIS Branch Office for information. The manufacturer shall comply with the QAP and maintain test records in accordance with para 2.1.

1.3 RECOMMENDED LEVELS OF CONTROL/CONTROL UNIT:

1.3.1 For the guidance of manufacturers, the recommended definition of control unit is :

- a) **For units manufacturing Composite Sheets/reels (and cartons, if manufactured from it)-** Multilayer laminated/extruded composite sheets/cartons of same variety (Ply, shelf life), style and capacity manufactured from the same material in a day
- b) **For Converter units manufacturing Composite Cartons only (from Composite Sheets/reels)** - The composite cartons of the same variety (Ply, shelf life), style, and capacity made from same batch of ISI marked composite sheet, produced under similar conditions of production in a day

1.3.2 For the guidance of manufacturers in preparing the Quality Assurance Plan, recommended levels of control are given in **Table 1**. Manufacturer has the discretion of declaring their own levels of control or accept the levels of control given in this document.

1.3.3 The manufacturer shall ensure inspection and testing as per the Quality Assurance Plan submitted by them on the whole production of the factory which is covered by this plan.

2. ENSURING COMPLIANCE THROUGH TESTING- manufacturers shall ensure compliance of their products to all the requirements of the Indian Standard for which they may have in-house test facilities. However, there is no obligation to maintain in-house laboratory. Licensee may use alternative arrangements for tests of the production as per the declared QAP. Various alternatives are available for operation of BIS certification as given below and the relevant guidelines for availing such relaxations by the manufacturers, as amended from time to time, are to be referred :

- i) Shared testing resources like common facility,
- ii) Cluster based testing facility,
- iii) Sub-contracting to outside laboratories which may either be:
 - a) BIS recognised/empanelled laboratories, or
 - b) Any accredited laboratory as per ISO/IEC 17025

2.1 TEST RECORDS- The manufacturers shall maintain test records for the tests carried out (either in-house or at a sub-contracted or at shared test facility) to establish conformity of the product to the Standard for operation of licence. For the tests being subcontracted or conducted at a shared test facility, test results issued by the laboratories or test facilities, shall be made available for inspection by BIS.

3. PACKING AND MARKING - The Standard Mark as given in the Schedule of the licence shall be incorporated legibly and indelibly on the packaging of the product provided always that the material so marked conforms to each requirement of the specification.

3.1 Packing and Marking shall be done as per the Indian Standard.

3.2 **Additional Marking requirements:** Additionally, the following shall also be marked on product or package or both.

a) "For BIS certification details please visit www.bis.gov.in"

3.2.1 In case of converter units, the following shall also be marked

- a) Name of original sheet/reel manufacturing unit with its BIS licence number
- b) Name of Converter unit and his recognized trade mark, if any

4. HYGIENIC CONDITIONS- Aseptic conditions are to maintained in case of processing and packaging of aseptic laminated/extruded composite Sheets/reels/cartons.

5. REJECTION - The production which conforms to the Indian Standard and covered under the scope of this licence shall be marked with the Standard Mark. Disposal of non-conforming product shall be done in such a way so as to ensure that there is no violation of provisions of BIS Act,2016.

TABLE 1 A (For units manufacturing Composite Sheets/reels and cartons from it)
(Recommended Levels of Control By BIS- For Guidance Only)

(1)				(2)			
Cl.	Requirement	Test Methods		Levels of Control			
		Clause	Reference	No. of Sample	Frequency	Remarks	
4.1	MATERIALS	-	IS 17753	Each consignment	Conformity of materials to the requirement of the specification may be established through Test report from a laboratory recognized by the Bureau/ Government laboratories empaneled by the Bureau/ NABL accredited laboratories or Material/supplier’s test certificate or In-house factory test report. No testing is required if the material is ISI marked:		
	Construction	-	IS 17753				
4.1, Table 1	Grammage of paperboard	-	IS 1060(Part 5/Sec 5)	Firm to have adequate in- process controls to check compliance of this parameter given in the Indian Standard. However, appropriate records shall be maintained by the manufacturer for evidence of conformity			
4.1, Table 1	Thickness of Aluminum Foil	-	Annex-A of IS 8970				
4.1, Table 1	Thickness of Polyethylene	-	Annex-C of IS 2508				
4.3	Capacity	-	IS 17753				
5.2.1	Over-all Migration	5.2.1	IS 9845	one	once in a month		
5.2.2	Specific Migration	5.2.2	IS 3025(Part 2), A-4 of IS 5158, IS 9873(Part 6), IS 9845	one	once in a month		
5.2.3	Vibration Leakage Test	Annex-B	IS 17753	one	once in a month		
5.2.4	Shelf Life Test	-		one	once in a month		
	Total bacterial count,	-	ISO 8784-1	one	once in a month		
	Total spore count	-	ISO 8784-1	one	once in a month		
	Yeast and	-	ISO 8784-2	one	once in a month		

	mould delamination and deformation	-	IS 17753	one	once in a month	
5.2.5	Water Vapour Transmission Rate(WVTR)	Annex-C	IS 17846	one	Once in three Months	
	Oxygen Transmission Test(OTR)	-	IS 13360 (Part 8/Sec 6/Subsec 2).	one	Once in three Months	
5.2.6	Print Resistance Test	Annex D	IS 17753	one	Each Control Unit	
5.2.7	Ink Adhesion test	Annex E	IS 17753	one	Each Control Unit	

**TABLE 1 B (For converter units using ISI marked Composite Sheets/reels
(Recommended Levels of Control By BIS- For Guidance Only)**

(1)				(2)		
Cl.	Requirement	Test Methods		Levels of Control		
		Clause	Reference	No. of Sample	Frequency	Remarks
4.3	Capacity	-	IS 17753	Firm to have adequate in- process controls to check compliance of this parameter given in the Indian Standard. However, appropriate records shall be maintained by the manufacturer for evidence of conformity		
5.2.1	Over-all Migration	5.2.1	IS 9845	one	once in a month	
5.2.2	Specific Migration	5.2.2	IS 3025(Part 2), A-4 of IS 5158, IS 9873(Part 6), IS 9845	one	once in a month	
5.2.3	Vibration Leakage Test	Annex-B	IS 17753	one	once in a month	
5.2.4	Shelf Life Test	-		one	once in a month	
	Total bacterial count,	-	ISO 8784-1	one	once in a month	
	Total spore count	-	ISO 8784-1	one	once in a month	
	Yeast and mould	-	ISO 8784-2	one	once in a month	
	delamination and deformation	-	IS 17753	one	once in a month	
5.2.5	Water Vapour Transmission Rate(WVTR)	Annex-C	IS 17846	one	Once in three Months	
	Oxygen Transmission Test(OTR)	-	IS 13360 (Part 8/Sec 6/Subsec 2).	one	Once in three Months	
5.2.6	Print	Annex D	IS 17753	one	Each Control Unit	

	Resistance Test					
5.2.7	Ink Adhesion test	Annex E	IS 17753	one	Each Control Unit	

TABLE 2
RECORD OF COMPOSITE SHEET/REELS (ISI MARKED) RECEIVED (IN CASE OF CONVERTER UNITS)

Sl. No.	Name of the manufacturer with CM/L no (Sheet/Reel manufacturing Mill)	Particulars of test reports received with C.U/Lot no.	Date of manufacture (Month and year)	Details of Quantity received			Date of receipt	Date of carton converted from sheet/reels	Lot no.	Details of carton converted from sheets		Details of dispatch
				No of ply/layer	Capacity	Quantity				C.U/Lot no.	Quantity	
1	2	3	4	5	6	7	8	9	10	11	12	13