



PM/ IS 2046/ 1/ April 2019

PRODUCT MANUAL FOR
(Decorative Thermosetting Synthetic Resin Bonded Laminated Sheets)
According to IS 2046:1995

This Product Manual shall be used as reference material by all Regional/Branch Offices & licensees to ensure coherence 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 licence/certificate.

1.	Product	:	IS 2046:1995
	Title	:	Decorative Thermosetting Synthetic Resin Bonded Laminated Sheets
	No. of amendments	:	1
2.	Sampling Guidelines		
a)	Raw material	:	No specific requirement
b)	Grouping Guidelines	:	None
c)	Sample Size	:	Two sheets
3.	List of Test Equipment	:	Please refer Annex –A
4.	Scheme of Inspection and Testing	:	Please refer Annex –B
5.	Possible tests in a day	:	Please refer Annex – C
6.	Scope of the Licence :		
	Licence is granted to use Standard Mark as per IS 2046:1995 with the following scope:		
	Name of the product	Decorative Thermosetting Synthetic Resin Bonded Laminated Sheets	
	Material Type	Type S or Type P or Type F	
	Index numbers for specifying HPL properties	i) Index 1, 2,3	
	Thickness	Thickness of sheet in mm	
	Size	{upto L(mm) x W(mm)}	
	Alphabetical Classification	CGS/CGF/HDS/HDF/HGS/HGF/HGP/VGS/VGF/VGP and VLS	

ANNEXURE A
PRODUCT MANUAL FOR
(Decorative Thermosetting Synthetic Resin)
According to IS 2046:1995

LIST OF TEST EQUIPMENT

Major test equipment required to test as per requirements of Indian Standard.

S. No	Test Details	Clause Reference	Details Of Test Equipment Apparatus and Chemicals	
01	Colour and Pattern	5.1	Inspection Table with D65 Standard illuminate	
02	Surface Finish	5.2	Inspection Table with Different Viewing angle	
03	Thickness	5.3	Ratchet type Micrometer, Dial Gauge Indicator with 2 flat parallel measuring surfaces of at least 6 mm diameter, and capable of exerting a pressure of 10 to 100 kPa Vernier Calipers	
04	Appearance	5.4	Standardised Lighting Arrangement with Viewing at a Distance of 1.5 Mtr - Horizontal Inspection Table of Height 700 mm - Overhead Fluorescent Lighting Arrangement of colour temperature approx 500 K	
	Surface Defects	5.4.1		
	Edge Defects	5.4.2		Inspection table with light arrangement of 800 – 1000 lx Steel Scale
	Broken Corner	5.4.3		Inspection table with light arrangement of 800 – 1000 lx Steel Scale Right Angle
	Sanding Defects	5.4.4		Inspection table with light arrangement of 800 – 1000 lx
05	Warping	5.4.5	Straight Edge : Fabricated”	
			Dial Gauge with Stand	
			Steel Scale	
			Feeler Gauge 20 Blade	
06	Length & Width	5.4.6	Measuring Tape	
07	Straightness of Edge	5.4.7	Straight Edge as above	
08	Squareness	5.4.8	Squareness Scale “ Fabricated”	

09	Resistance To Surface Wear	Annex C S.No. I	Abrasion Resistance Testing Machine
			Specimen Holder in the form of Disk and rotates in horizontal plane at a frequency of 58 to 65 rpm
			Abrasive wheel – as per CI – 3.1.2
			Holding and Lifting Device : as per CI 3.1.3
			Digital Counter – 0-9999
			Zinc Plate
			Abrasion Strip as per C 2.2, a, b
10	Resistance to Immersion in Boiling Water	Annex D Sr. No ii	Boiling Water Bath
			Balance Make
			Electric Oven
			Water Vessel
			Dessicator
			Micrometer as above
			Specimen Holder
			Hot Plate
			Distilled water
11	Resistance to Dry heat at 180 ⁰ C	Annex E Sr. No. iii	Materials: Glycerol tristearate or similar material, fine faced wood chipboard, urea formaldehyded adhesive
			Resistance to dry heat apparatus consisting of cylindrical vessel of cast aluminium or aluminium alloy, heat source, inorganic heat insulating board and thermometer
12	Dimensional stability at deviated temperature	Annex F Sr. No. iv	Oven
			Conditioning chambers
			Bedplate and mounted dial gauge
			Rigid Jig and dessicator
13	Dimensional Stability a 20 ⁰ C	Annex G No. v	Vernier caliper
			Conditioning Chamber as above
			Dessicator
			Distilled Water
			Water Bath as above
			Ethanol
			Stop Watch
Vernier Caliper			

14	Resistance to impact by small diameter ball	Annex H Sr No vi	High quality fine faced wood chipboard
			Urea formaldehyde adhesive
			Solution of dye in alcohol, graphite or talcum
			Impact tester
			Arrangement capable of being suspended from the impact bolt to exert a compressive force on the spring (e.g. scale pan, weights)
15	Resistance to impact by large diameter balls	Annex J Sr No vii	Free fall test apparatus
			Polished steel ball
			Specimen Clamping frame
16	Resistance to cracking (thin laminates)	Annex K Sr No viii	Clamping device
			Conditioning chamber
			Electrically heated over with air circulation
			Hand Lens 6 x
			Lighting 80 – 100 lx
17	Resistance to scratching	Annex L Sr No ix	Scratch testing apparatus (with hemispherical diamond scratching point)
			Viewing enclosure
			Conditioning chamber
			Viewing mash
18	Resistance to staining	Annex M Sr No x	Staining material as per Annex M
			Glass covers
			Thermometer (up to 100 C)
			Flat bottomed aluminium vessel
			Hot plate
			Horizontal inspection surface
			Wetting agent
			Hard nylon bristle brush, soft cloth
			Ethanol 95%, acetone, MEK, trichloroethane etc.
19	Resistance to colour change		
	In Xenon Arc Light	Annex N Sr No xi	Xenon Arc lamp, test enclosure, black panel thermometer, specimen holders, blue dyed wool standards nos 1 to 7 and the grey slab for assessing change in colour, conditioning chamber (60 +5 C)
	In enclosed carbon arc light	Annex O Sr No xi	Enclosed carbon arc lamp, test enclosure, black panel thermometer, specimen holders, blue dyed wool standards nos 1 to 7 and the grey slab for assessing change in colour, conditioning chamber (60 +5 C)

20	Resistance to Cigarette Burns	Annex P Sr No xii	Fine faced wood chipboard, urea formaldehyde adhesive, pale tobacco cigarettes unfiltered (3), ethanol soft cloth Conditioning chamber (T 27+-C, RH 65+-5%)
	Resistance to Cigarette Burns (Simulated using electric heater) – Alternative	Annex Q Sr No xii	Fine faced wood chipboard, urea formaldehyde adhesive Heating element support, heating element or Fe-Al alloy in spiral shape, adjustable mounting, calibration block, glass windowed cover, stopwatch, power source, control circuit, potentiometer, cotton wick, Conditioning chamber (T 27+-C, RH 65+-5%)
21	Formability	Annex R Sr No xiii	Method A: Radiant heater, variable output transformer, temp indicators (thermal crayons or waxes), stopwatch, forming apparatus, conditioning chamber, strips of solid colour white laminate Method B: Radiant heater element, forming jig, clamping device, L-shaped forming bar, temp indicators (thermal crayons or waxes), stopwatch, thickness gauge, conditioning chamber
22	Resistance to blistering	Annex S Sr No xiv	Method A: Same as formability Method A plus an additional timer Method B: Same as formability Method B plus an additional timer
23	Resistance to steam	Annex T Sr No xv	Erlenmeyer flask , specimen holder and heat resistance screen, non-fibrous filter paper, hand lens (6x), electric hot plate
24	Resistance to crazing (thick laminates)	Annex W Sr No xvi	Specimen Holder, electrically heated oven, hand lens (6x), lighting (800-1000 lx), conditioning chamber
25	Resistance to moisture (Double faced compact laminates)	Annex Y Sr No xvii	Water bath capable of being maintained at 65 +-2 C
26	Flexural Modulus	Annex F of IS 13411 Sr No xviii	Standard Testing machine as per Annex F of IS 13411:1992
27	Flexural strength	Annex F of IS 13411 Sr No xix	Standard Testing machine as per Annex F of IS 13411:1992

28	Tensile strength	IS 13360 Part 5/Sec. 2 & 3* *IS 8543 (Part 4/Sec 1):1984 is withdrawn and superseded	Tensile Testing Machine as per IS 13360 (Part 5/Sec 1):2018/ISO 527-1:2012
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Remarks:

1. The least count and range of test equipment should match the value/parameters/tolerances mentioned in the Indian Standard.
2. The list is meant for guidance only and may not be taken as exhaustive.

ANNEXURE B
PRODUCT MANUAL FOR
(Decorative Thermosetting Synthetic Resin)
According to IS 2046:1995

SCHEME OF INSPECTION AND TESTING

1.LABORATORY - A laboratory shall be maintained which shall be suitably equipped (as per the requirement given in column 2 of Table 1) and staffed, where different tests given in the specification shall be carried out in accordance with the methods given in the specification.

1.1 The manufacturer shall prepare a calibration plan for the test equipments.

2. TEST RECORDS –The manufacturer shall maintain test records for the tests carried out to establish conformity.

3.PACKING AND MARKING– The Standard Mark, as given in the Schedule of the licence, shall be printed on the label applied to each container and the covering carton, provided always that the materials in the container to which the Mark is thus applied conforms to every requirement of the specification.

3.1 Packing and Marking shall be done as per the provisions of IS 2046. In addition, the following details shall be marked on a label attached to each bundle or stencilled on each section:

- i) Size and thickness of the sheets
- ii) BIS Licence Number CM/L—and
- iii) BIS website details i.e. “For details of BIS certification please visit www.bis.gov.in”

4. CONTROL UNIT –For the purpose of this scheme, the total quantity of laminated sheets similar in regard to type/class and produced on the same day shall constitute a control unit.

5. LEVELS OF CONTROL - The tests as indicated in column 1 of Table 1 and the levels of control in column 3 of Table 1, shall be carried out on the whole production of the factory which is covered by this plan and appropriate records maintained in accordance with paragraph 2 above.

5.1 All the production which conforms to the Indian Standards and covered by the licence should be marked with Standard Mark.

6. REJECTIONS–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. It may be disposed off in rejection.

TABLE 1
LEVELS OF CONTROL

(Para 5 of Scheme of Inspection and Testing)

(1)				(2)	(3)		
Clause	Requirements	Test Method Clause Reference		Test equipment requirement R: required (or)S: Sub-contracting permitted	No. of samples	Frequency	Remarks
5.1	Colour and Pattern	5.1	IS 2046:1995	R	One	Each Control unit	
5.2	Surface finish and Reserve side/ bonding	5.2.1 & 5.2.2	-do-	R	-do-	-do-	
5.3	Thickness	5.3.1	-do-	R	Two from each size	-do-	
5.4	Appearance			R			
5.4.1	Surface defects	5.4.1	-do-	R	5% subject to a minimum 5 sheets from every control unit	-do-	
5.4.1.1	Spot, dirt, and similar surface defects	5.4.1.1	-do-	R	-do-	-do-	
5.4.1.2	Fibers, hairs scratches	5.4.1.2	-do-	R	-do-	-do-	
5.4.1.3	Accumulated (combinations) of surface defects	5.4.1.3	-do-	R	-do-	-do-	
5.4.2	Edge defect	5.4.2	-do-	R	-do-	-do-	
5.3.3	Broken corners	5.4.3	-do-	R	-do-	-do-	
5.4.4	Sanding Defects	5.4.4	IS 2046:1995	R			
5.4.5	Warping	5.4.5	-do-	R	-do-	-do-	
5.4.6	Length and width	5.4.6	IS 2046:1995	R	Two from every size	Each Control unit	

5.4.7	Straightness of Edges	5.4.7	-do-	R	-do-	-do-	
5.4.8	Squareness of the laminates	5.4.8	-do-	R	-do-	-do-	
5.5 & Table 7	Other properties						
i)	Resistance to surface wear	Annex C	-do-	R	One	Once in three days*	
ii)	Resistance to immersion in bonding water	Annex D	-do-	R	-do-	Once in a day*	
iii)	Resistance to Dry heat	Annex E	-do-	R	-do-	Once in a week*	
iv)	Dimensional stability at elevated temp	Annex F	-do-	R	-do-	-do-	
v)	Dimensional stability at 20°C	Annex G	-do-	R	-do-	Once in two weeks*	
vi)	Resistance to impact by small dia ball	Annex H	-do-	R	-do-	Once in two weeks*	
vii)	Resistance to impact by large dia ball	Annex J	-do-	R	-do-	-do-	
viii)	Resistance to cracking	Annex K	IS 2046: 1995-	R	One	Every alternate day*	
ix)	Resistance to scratching	Annex L	-do-	R	-do-	Once a week*	
x)	Resistance to Staining	Annex M	-do-	R	-do-	Once a day*	
xi)	Resistance to colour change	Annex N Alternate Annex-O	-do-	S	-do-	Once in six months**	
xii)	Resistance to cigarette burns.	Annex P Alternate Annex G	-do-	R	-do-	Once a week	
xiii)	Formability. Method A Method B	Annex R -do-	-do-	R	-do-	-do-	
xiv)	Resistance to blistering Method A Method B	Annex S -do-	-do-	R	-do-	-do-	
xv)	Resistance to steam	Annex T	-do-	R	-do-	Once in three days*	

xvi)	Resistance to crazing	Annex W	-do-	R	-do-	Once in three days*	
xvii)	Resistance to Moisture.	Annex Y	-do-	R	-do-	-do-	
xviii)	Flexural Modulus	Annex F of IS 13411	-do-	R	-do-	-do-	
xix)	Flexural strength	-do-	-do-	R	-do-	-do-	
xx)	Tensile Strength		IS 13360 Part 5/Sec. 2 & 3	R	-do-	-do-	

* Subject to the condition that all types/classes of laminates are covered in a month.

** Subject to the condition that all types/classes of laminates are covered in two years.

Note-1: Whether test equipment is required or sub-contracting is permitted in column 2 shall be decided by the Bureau and shall be mandatory. Sub-contracting is permitted to a laboratory recognized by the Bureau or Government laboratories empanelled by the Bureau.

Note-2: Levels of control given in column 3 are only recommendatory in nature. The manufacturer may define the control unit/batch/lot and submit his own levels of control in column 3 with proper justification.

ANNEXURE C
PRODUCT MANUAL FOR
(Decorative Thermosetting Synthetic Resin)
According to IS 2046:1995

POSSIBLE TESTS IN A DAY

Following tests can be carried out in a day* during the visit:

- i. Colour and Pattern
- ii. Surface finish and Reserve side/ bonding
- iii. Thickness
- iv. Appearance
- v. Surface defects
- vi. Spot, dirt, and similar surface defects
- vii. Fibers, hairs scratches
- viii. Accumulated (combinations) of surface defects
- ix. Edge defect
- x. Broken corners
- xi. Sanding Defects
- xii. Warping
- xiii. Length and width
- xiv. Straightness of Edges
- xv. Squareness of the laminates
- xvi. Resistance to surface wear
- xvii. Resistance to impact by small dia ball
- xviii. Resistance to impact by large dia ball
- xix. Resistance to scratching

*Considering availability of preconditioned samples, where necessary