



PRODUCT MANUAL FOR MEDIUM DENSITY FIBRE BOARDS FOR GENERAL PURPOSES ACCORDING TO IS 12406: 2003

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 12406 : 2003
	Title	:	MEDIUM DENSITY FIBRE BOARDS FOR GENERAL PURPOSES
	No. of Amendments	:	5
2.	Sampling Guidelines:		
a)	Raw material	:	Not applicable
b)	Grouping guidelines	:	Please refer ANNEX – A
c)	Sample Size	:	One Board for all tests
3.	List of Test Equipment	:	Please refer ANNEX – B
4.	Scheme of Inspection and Testing	:	Please refer ANNEX – C
5.	Possible tests in a day :		
	(i) Finish (Clause 7)		
	(ii) Dimension and tolerance (Clause 8)		
6.	Scope of the Licence :		
	Please refer ANNEX – D		

ANNEX A**Grouping Guidelines**

1. Medium Density Fibre Boards for general purposes are classified as given below:

Grade	Designation
Solid Board Grade I	SBG I
Solid Board Grade II	SBG II

2. Each Grade is further sub-classified based on formaldehyde content/emission as Formaldehyde Class E_1 and Formaldehyde Class E_2 .
3. The following are also taken into consideration while evolving the grouping guidelines:
- Any other dimensions (Length, Width and Thickness) as agreed to between the purchaser and the manufacturer may also be used.
 - Requirements specified for Modulus of Rupture, Modulus of Elasticity and Internal Bond are more stringent for Boards with thickness upto 20 mm.
 - Within the grades, Screw Withdrawal Strength test for edge is applicable for Boards having thickness above 12 mm.
 - For all tests, Grade I is having stringent requirements than Grade II.
 - Formaldehyde Class E_1 is stringent than Class E_2 .
4. The following grouping guidelines for GoL/CSoL shall be followed:
- One sample from each Formaldehyde Class of each Grade of thickness above 12 mm and upto 20 mm shall be tested for all requirements in order to cover the complete range of sizes for that Grade and Class. If sample of thickness upto and including 12 mm is tested, varieties in the licence shall be considered for thickness upto and including 12 mm. If sample of thickness above 20 mm is tested, varieties in the licence shall be considered for thickness above 20 mm only.
 - If sample from Grade I is tested corresponding sizes in Grade II may also be covered.
 - If sample of Formaldehyde Class E_1 is tested, then corresponding sizes of Boards of Formaldehyde class E_2 may also be covered.
5. The Firm shall declare the varieties of Boards they intend to cover in the Licence. The Scope of Licence may be restricted based on the Manufacturing and Testing capabilities of the Manufacturer.
6. During the operation of the Licence, BOs shall ensure that all the varieties covered in the Licence are tested in rotation, to the extent possible.

ANNEX B**List of Test Equipment***Major test equipment required to test as per the Indian Standard*

S. No.	Tests used in with Clause Reference	Test Equipment
1.	Finish (Clause 7) and Dimensions and tolerance (Clause 8 & 11.3)	Stainless Steel Scale Measuring Tape Vernier Caliper Micrometer Right Angle Straightness gauge
2.	Density (Clause 11.4)	Hot air oven Weighing balance
3.	Moisture content (Clause 11.5)	Hot air oven Weighing balance
4.	Water absorption (Clause 11.6)	Water bath Soluble sealant material such as wax
5.	Test for linear expansion (Swelling in water)- Due to general absorption (Clause 11.7.1)	Water bath Soluble sealant material such as wax Arrangement for measurement of change in length
6.	Swelling due to surface absorption (Clause 11.7.2)	Water bath Soluble sealant material such as wax Micrometer
7.	Modulus of Rupture and Modulus of Elasticity (Clause 11.8)	Tensile testing machine with bend facility and with attachment for static bending test and with variable speed Extensometer/Dial gauge
8.	Internal bond (Clause 11.9)	Loading fixture for tension test perpendicular to surface
9	Internal bond (Clause 11.9.1) a) Cyclic test	Loading fixture for tension test perpendicular to surface Hot air oven Water bath
	b) Accelerated water resistance test	Loading fixture for tension test perpendicular to surface Water bath
10	Screw withdrawal test (Clause 11.10)	Screws Tensile testing machine
11	Formaldehyde content/Emission Fc (Clause 11.11)	Precision balance Hot air oven Extraction apparatus Volumetric flask Precision burette Pipette Measuring cylinder

		<p>Toulene Sulphuric acid Sodium thiosulfate Sodium hydroxide Starch solution</p>
		<p>Test chamber as per clause 6.1 of IS/ISO 12460-1 Equipments for monitoring test conditions Air sampling system Washing bottles Silica absorber Gas flow valve Gas flow meter Spectrophotometer Water bath Volumetric flask Bulb pipette Micro burette Flasks Weighing balance Acetyl-acetone solution Ammonium acetate solution Iodine solution Sodium thiosulphate solution Sodium hydroxide solution Sulphuric acid Starch solution</p>
12	Adhesive test	<p>Hot water bath Hot air oven Knife as per IS 1734 (Part 5) pH meter</p>
13	General test equipments	<p>Stop watch Thermometer Air conditioner Drill machine Sample cutter Humidity chamber Weighing balance</p>

The above list is indicative only and may not be treated as exhaustive.

ANNEX C

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. LABELLING AND MARKING– As per the requirements of IS 12406: 2003.

4. CONTROL UNIT –**Medium Density Fibre Boards for general purposes of the same designation (Grade) and Formaldehyde Class, manufactured with the same batch of adhesive compound during a shift of eight hours subject to a maximum 1000 Boards** shall constitute a control unit.

5. LEVELS OF CONTROL - The tests as indicated in column 1 of Table 1 and the levels of control submitted by the manufacturer 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 Standard 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.

TABLE 1

(1)				(2)	(3)		
Test Details				Test equipment requirement R: required (or) S: Sub-contracting permitted	Recommended Levels of Control		
Clause	Requirement	Test Methods Clause Reference			No. of Sample	Frequency	Remarks
5.2	Adhesive	5.2	IS 12406	S	-	-	No further testing is required if accompanied with the Test Certificate. If adhesive is manufactured inhouse, proper test record for specified requirements for each lot manufactured shall be maintained.
5.3	Sizing material	5.3	IS 12406	S	One	Each lot	
5.4	Preservative Treatment	5.4	IS 12406	R	One	Each Lot	
7	Finish	7, Annex B	IS 12406	R	Each board	-	-
8 and 11.3	Dimensions and Tolerances	8, 11.3	IS 12406 IS 2380 (Part 2)	R	Three	Every hour production	In case of failure in dimensions, all Boards manufactured during the hour shall be checked and only those conforming shall be marked.
9.1, 10.2.1 (a), 11.4 and Table 1	Density	11.4	IS 12406 IS 2380 (Part 3)	R	Two	Each control unit	##
9.1, 10.2.1 (b), 11.5 and Table 1	Moisture content	11.5	IS 12406 IS 2380 (Part 3)	R	Two	Each control unit	
9.1, 10.2.1 (c), 11.6 and Table 1	Water absorption test a) 2 h and b) 24 h	11.6	IS 12406 IS 2380 (Part 16)	R	Two	Each control unit	

9.1, 10.2.1 (d), 11.7 and Table 1	Linear expansion a) Due to general absorption b) Due to surface absorption	11.7.1 11.7.2	IS 12406 IS 2380 (Part 17)	R	Two	Each control unit	
9.1, 10.2.1 (e), 11.8 and Table 1	Modulus of rupture and Modulus of elasticity	11.8	IS 12406 IS 2380 (Part 4)	R	Two	Each control unit	##
9.1, 10.2.1 (f), 11.9 and Table 1	Internal bond	11.9	IS 12406 IS 2380(Part 5)	R	Two	Each control unit	##
9.1, 10.2.1 (f), 11.9.1 and Table 1	Internal board a) After cyclic test or	11.9.1	IS 12406 IS 2380(Part 5)	S	Two	Once in three months for each type, grade and sub-classification.	@ @
	b) After accelerated water resistance test	11.9.1	IS 12406 IS 2380(Part 5)	R	Two	Each control unit	##
9.1, 10.2.1 (h), 11.10 and Table 1	Screw withdrawal test a) Face b) Edge	11.10	IS 12406 IS 2380(Part 14)	R	Two	Each control unit	##
9.2 9.2.1, or 9.2.2	Formaldehyde content/Emission, <i>F_c</i>	9.2, 11.1.1	IS 12406 IS 13745	R	Two	Each control unit	## The manufacturer may test the product either for Formaldehyde content or for Steady state formaldehyde emission value.
			Or IS 12406 IS/ISO 12460-1	S	Two	Once in three months for each type and grade	

If both the samples fail, the control unit shall be rejected and shall not be marked. If one sample fails, then two additional samples shall be taken from the same control unit for retesting. If any retested sample fails, the control unit shall be rejected and shall not be marked.

@@ If any sample fails, marking shall be stopped. Marking shall be resumed only after passing of improved lots produced after taking corrective actions. Frequency of testing shall be maintained as once in a month for each type, grade/subclass of boards till three consecutive samples pass and there after original frequency of testing shall be resumed.

Note- 1: Sub-contracting is permitted to a laboratory recognized by the Bureau or Government laboratories empanelled by the Bureau.

Note-2 The control unit and levels of control as decided by the Bureau are obligatory to which the licensee shall comply with.

ANNEX-D**Scope of the Licence :**

Licence is granted to use Standard Mark as per IS 12406 : 2003 with the following scope:	
Name of the product	MEDIUM DENSITY FIBRE BOARDS FOR GENERAL PURPOSES
Grade	Solid Board Grade I / Solid Board Grade II
Formaldehyde Class	E1/E2
Size	Upto and including --- mm thickness