भारतीय मानक ब्यूरो
(उपभोक्ता मामले, खाद्य एवं सार्वजनिक वितरण मंत्रालय, भारत सरकार)
BUREAU OF INDIAN STANDARDS
(Ministry of Consumer Affairs, Food & Public Distribution, Govt. of India)

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व्यापक परिचालन मसौदा

हमारा संदर्भ : सीईडी 20/टी-65 **05 अगस्त 2024**

तकनीकी समिति : लकड़ी और अन्य लिग्नोसेल्युलोसिक उत्पाद अनुभागीय समिति , सीईडी 20
प्राप्तकर्ता :

1. **सिविल अभियांत्रिकी विभाग परिषद, सीईडीसी के सभी सदस्य**
2. **लकड़ी और अन्य लिग्नोसेल्युलोसिक उत्पाद अनुभागीय समिति , सीईडी 20 के सभी सदस्य**
3. **रुचि रखने वाले अन्य निकाय।**

महोदय/महोदया,

निम्नलिखित मानक का मसौदा संलग्न है:

प्रलेख संख्या	शीर्षक
सीईडी 20(26301)WC	**ओरिएंटेड स्ट्रैंड बोर्ड – विशिष्टि** (आई सी एस संख्या : 790.060.20)

कृपया इस मसौदे का अवलोकन करें और अपनी सम्मतियाँ यह बताते हुए भेजे कि यह मसौदा प्रकाशित हो तो इन पर अमल करने में आपको व्यवसाय अथवा कारोबार में क्या कठिनाइयां आ सकती हैं।

सम्मतियाँ भेजने की अंतिम तिथि: 04 अक्टूबर 2024

सम्मति यदि कोई हो तो कृपया अधोहस्ताक्षरी को ई-मेल द्वारा ced20@bis.gov.in पर या उपरलिखित पते पर, संलग्न फोर्मेट में भेजें। सम्मतियाँ बीआईएस ई-गवर्नेंस पोर्टल, www.manakonline.in के माध्यम से ऑनलाइन भी भेजी जा सकती हैं।

यदि कोई सम्मति प्राप्त नहीं होती है अथवा सम्मति में केवल भाषा संबंधी त्रुटि हुई तो उपरोक्त प्रालेख को यथावत अंतिम रूप दे दिया जाएगा। यदि सम्मति तकनीकी प्रकृति की हुई तो विषय समिति के अध्यक्ष के परामर्श से अथवा उनकी इच्छा पर आगे की कार्यवाही के लिए विषय समिति को भेजे जाने के बाद प्रालेख को अंतिम रूप दे दिया जाएगा।

यह प्रालेख भारतीय मानक ब्यूरो की वेबसाइट www.bis.gov.in पर भी उपलब्ध हैं।

धन्यवाद।

भवदीय
ह/-
द्वैपायन भद्र
वैज्ञानिक ई एवं प्रमुख
सिविल अभियांत्रिकी विभाग

संलग्न: उपरलिखित

भारतीय मानक ब्यूरो
(उपभोक्ता मामले, खाद्य एवं सार्वजनिक वितरण मंत्रालय, भारत सरकार)
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WIDE CIRCULATION DRAFT

Our Reference: CED 20/T-65 **05 August 2024**

TECHNICAL COMMITTEE: WOOD AND OTHER LIGNOCELLULOSIC PRODUCTS SECTIONAL COMMITTEE, CED 20

ADDRESSED TO:

1. All Members of Civil Engineering Division Council, CEDC
2. All Members of Wood And Other Lignocellulosic Products Sectional Committee, CED 20 and its Subcommittees
3. All others interested.

Dear Sir/Madam,

Please find enclosed the following draft:

Doc No.	Title
CED 20(26301)WC	**Oriented Strand Board – Specification (ICS 79.060.20)**

Kindly examine the attached draft and forward your views stating any difficulties which you are likely to experience in your business or profession, if this is finally adopted as National Standard.

Last Date for comments: 04 October 2024

Comments if any, may please be made in the enclosed format and emailed at ced20@bis.gov.in or sent at the above address. Additionally, comments may be sent online through the BIS e-governance portal, www.manakonline.in.

In case no comments are received or comments received are of editorial nature, kindly permit us to presume your approval for the above document as finalized. However, in case comments, technical in nature are received, then it may be finalized either in consultation with the Chairman, Sectional Committee or referred to the Sectional Committee for further necessary action if so desired by the Chairman, Sectional Committee.

The document is also hosted on BIS website www.bis.gov.in.

Thanking you,

Yours faithfully,
Sd/-
Dwaipayan Bhadra
Scientist 'E' & Head
Civil Engineering Department

Encl: As above

FORMAT FOR SENDING COMMENTS ON THE DOCUMENT

[Please use A4 size sheet of paper only and type within fields indicated. Comments on each clause/sub-clause/ table/figure, etc, be stated on a fresh row. Information/comments should include reasons for comments, technical references and suggestions for modified wordings of the clause. Comments through e-mail to **ced20@bis.gov.in** shall be appreciated.]

Doc. No.: CED 20(26301WC

BIS Letter Ref: CED 20/T-65

Title: Oriented Strand Board – Specification (ICS 79.060.20)

Last date of comments: 04 October 2024

Name of the Commentator/ Organization: _____

Sl No.	Clause/ Para/ Table/ Figure No. commented	Type of Comment (General/ Technical/ Editorial)	Comments/ Modified Wordings	Justification of Proposed Change

NOTE- Kindly insert more rows as necessary for each clause/table, etc

BUREAU OF INDIAN STANDARDS

DRAFT FOR COMMENTS ONLY

Draft Indian Standard

Oriented Strand Board – Specification

(ICS 79.060.20)

Wood and Other Lignocellulosic Products Sectional Committee, CED 20

Last Date of comments – 04 October, 2024

FOREWORD

(*Formal clauses will be added later*)

Oriented strand board is a multi-layered panel made from strand of wood of a predetermined shape and thickness together with a binder by the application of heat and pressure. The strands in the external layer are aligned and parallel to the board length or width; the strands in the centre layer or layers can be randomly oriented or aligned generally at right angles to the strands of the external layers.

Oriented strand boards are recommended for use in interior locations, furniture, load-bearing and heavy duty load-bearing applications. Based on atmospheric conditions of uses, oriented strand boards are further graded as Regular grade for use in dry conditions and Moisture Resistant (MR) grade for use in humid conditions.

Surface wise it cover uncoated (both plan and smooth-fine surfaces), prelaminated and veneered oriented strand boards. In the prelaminated boards are further classified based on type of laminations as Type 1, Type 2, Type 3 and Type 4. And for veneered boards the surface wise classification as Type 1 and Type 2.

This standard gives restriction on formaldehyde release in the form of formaldehyde content and formaldehyde emission requirements. Both formaldehyde content and emission can have requirements under Class E_1 and Class E_2. The Class E_1 is more stringent than Class E_2.

In formulation of this standard, due weightage has been given to standards and practices prevailing in different countries and also relating the same to the climatic conditions and requirements in our country.

A scheme of labelling environment friendly products known as ECO-Mark has been instituted at the instance of the Ministry of Environment, Forests and Climate Change, Government of India. The ECO-Mark is administered by the Bureau of Indian Standards (BIS) under the Bureau of Indian Standards Act, 2016 as per the Resolution No. 71 dated 21st February 1991 and Resolution No. 425 dated 20 October 1992 published in the Gazette of the Government of India. For a product to be eligible for ECO-Mark, it shall also carry the Standard Mark (ISI mark) of BIS besides meeting.

For this purpose, the Standard Mark of BIS would be a single mark being a combination of the ISI Mark and the ECO logo. Requirements to be satisfied for a product to qualify for the BIS Standard Mark for ECO friendliness will be optional. Manufacturing units will be free to opt for ISI Mark alone also. The ECO criteria are based on the Gazette Notification No. 170 dated 16 May 1996 for wood substitutes as environment friendly products published in the Gazette of Government of India, as revised/amended from time to time.

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

Oriented Strand Board – Specification

1 SCOPE

This standard covers definition, classification and requirements of uncoated (plain surface and smooth-fine surface), pre-laminated and veneered surface oriented strand boards panels manufactured from wooden strands that are arranged in cross-oriented layers for general purposes (interior), furniture and load bearing applications.

2 REFERENCE

The standards listed in Annex A contain provisions which through reference in this text, constitute the provision 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 indicated in Annex A.

3 TERMINOLOGY

For purpose of this standard, the definitions given in IS 707 and the following shall apply.

3.1 Oriented Strand Boards (OSB)

Multi layered board made from strand of wood of a predetermined shape and thickness together with a binder by the application of heat and pressure. The strands in the external layer are aligned and parallel to the board length or width; the strands in the centre layer or layers can be randomly oriented or aligned generally at right angles to the strands of the external layers.

3.2 Oriented Strand Boards with Smooth-Fine Surface (S-OSB)

Multi-layered board made from strands of wood of pre-determined shape and thickness, together with a binder, by the application of heat and pressure, with the strands in them layers aligned and parallel to the board length or width with fine smooth surfaced external layers on both sides.

3.3 Prelaminated Oriented Strand Board (PS-OSB)

An oriented strand boards with smooth fine surface (*see* **3.2**) laminated on both surfaces by synthetic resin impregnated base papers with or without impregnated overlay under the influence of heat and pressure.

3.4 Veneered Oriented Strand Board (VS-OSB)

An oriented strand boards with smooth fine surface (*see* **3.2**) with veneered surface on one side or on both sides with veneers or decorative veneers**.**

3.5 Axis

3.5.1 *Major Axis (Along the Length)*

Direction in the plane of the board in which the bending properties have a higher value.

3.5.2 *Minor Axis (Across the Length)*

Direction in the plane of the board at the right angles to the major axis.

3.6 Dry Conditions

Condition defined in terms of Hazard Class 1 refers to environment with relative humidity less than or equal to 70 percent so that equilibrium moisture content of oriented strand board will not be more than 15 percent.

3.7 Humid Conditions

Condition defined in terms of service Hazard Class 2 refers to environment with relative humidity more than 70 percent so that equilibrium moisture content of oriented strand board will not be more than 20 percent.

3.8 General Purpose (GP) - Non-load-bearing applications, interior fitments and furniture

3.9 Load-Bearing (LB) - Denotes a structural or designed application, such as building elements or use as a component in a structural element such as the webs of I-joists.

NOTE - Examples of building elements are walls, roof and floor.

3.10 Heavy Duty Load-Bearing (HLB)

Special load-bearing grade of oriented strand board with increased properties for more demanding applications

3.11 Strand

Manufactured wood element of a predetermined shape with an average length of more than 50 mm and average thickness less than 3 mm.

3.12 Regular (REG) Grade - Product suitable for applications in dry conditions.

3.13 Moisture Resistant (MR) Grade - Product suitable for applications involving humid conditions.

4 CLASSIFICATIONS

4.1 Types

Based on the surface finish, uncoated oriented strand boards (OSB) shall be categorized in two types as follows:

i) Oriented strand board with Plain Surface (OSB) (*see* **3.1**)
ii) Oriented strand board with Smooth Fine Surface (S-OSB) (*see* **3.2**)

Finishes of the above grades may be sanded or unsanded as per agreement between manufacturer and the purchaser.

4.2 Grades

Based on the mechanical properties, oriented strand boards shall be further classified in following four grades:

i) *OSB GP-REG (OSB/1 or S-OSB/1)* - General purpose use in dry conditions (*see* **3.6**);
ii) *OSB LB-REG (OSB/2 or S-OSB/2)* - Load-bearing for use in dry conditions (*see* **3.7**);
iii) *OSB LB-MR (OSB/3 or S-OSB/3)* - Load-bearing for use in humid conditions (*see* **3.7**); and
iv) *OSB HLB-MR (OSB/4 or S-OSB/4)* - Heavy duty load-bearing OSB for use in humid conditions (*see* **3.7**).

NOTE - Load bearing boards are used for constructions of walls, roofing stiffening building elements etc.

4.3 Prelaminated Oriented Strand Board (PS-OSB) Types

Based on the surface abrasion characteristics, each grade (*see* **4.2**) of prelaminated oriented strand board (*see* **3.3**) shall further classified in four surface types, that is, Type 1, 2, 3 and 4.

NOTE - Type 1 is useful for restaurant table top application. Type 2 is useful for horizontal applications like cash counters and office tabletops. Type 3 is useful for normal horizontal applications like office tabletops and domestic furniture tops. Type 4 is for less contact/ less traffic area/ less abrasion area may be for vertical application only.

4.4 Veneered Oriented Strand Board (VS-OSB) Types

For veneered oriented strand board (*see* **3.4**), each grade (*see* **4.2**) shall further classified in two surface types.

i) Type 1 (*Veneered Oriented Strand Board, General Purpose*) – These are veneered oriented strand board of solid core with faces of veneer of general purpose type.
ii) Type 2 (*Veneered Oriented Strand Board, Decorative Purpose*) – These are veneered oriented strand board with solid core but faced on one side or on both sides with decorative veneers.

4.5 Formaldehyde Classes – In terms of formaldehyde class, each grade (*see* **4.2**) oriented strand board shall be further classified in two classes as follows:

i) Formaldehyde Class, E_1
ii) Formaldehyde Class, E_2

5 MATERIALS

5.1 Timber

5.1.1 Any species of timber may be used for manufacturer of oriented strand boards.

5.1.2 The species of timber for the decorative face veneer and adhesive used in bonding of veneers in decorative type of veneered OSB shall be as per IS 3087 [third revision under preparation and at wide circulation stage. Doc No: CED 20 (26076) WC] or as specified by the purchaser while placing the order.

5.1.3 For prelaminated type of oriented strand board, the prelamination type shall be as per IS 3087 (third revision under preparation and at wide circulation stage. Doc No: CED 20 (26076) WC.

5.1.4 For ECO-mark, only species of wood from sources other than natural forests includes, Tree Outside Forest (TOF), agroforestry, farm forestry, industrial and social forestry plantations, etc and shade trees from tea and coffee estates shall be used for the manufacturer of oriented strand boards.

5.2 Adhesives

Any suitable type of resin adhesive may be used for the purpose of bonding so that the boards comply with physical, mechanical and formaldehyde release requirements given in this standard.

5.3 Preservative

A suitable preservative may be added to the mix at the mixing stage of adhesive. The following preservatives are regarded as suitable and their percentage is given on the basis of oven dry weight of the particles.

a) Sodium pentachlorophenate to the extent of 2 percent; and
b) Trichlorophenol to the extent of 5 percent.

NOTE – Other type and method of preservative treatment may also be done as per agreement between manufacturer and purchaser and shall be declared by the manufacturer.

6 MANUFACTURE

6.1 Uncoated Oriented Strand Board

6.1.1 Strands of wood for manufacturing of oriented strand boards are produced by cutting wood into strands with a maximum width of 50 mm using a suitable chipping machine. These strands are then dried to the desired moisture content in a mechanical dryer. Once dried, the strands are blended thoroughly with the appropriate amount of adhesive in mechanical mixers or applicators, ensuring that the binder's moisture content does not significantly increase the strands' moisture level. The well-blended strands are then formed into a pre-pressed mat, which is subsequently pressed under controlled conditions of heat and pressure for desired thickness and curing of boards. After pressing, the boards shall be cooled, trimmed, and cut to standard sizes.

6.1.2 In case of smooth-fine surface oriented strand boards, in the manufacturing process (*see* **6.1.1**), the external layers on both sider shall be smooth and of fine materials.

6.2 Prelaminated Oriented Strand Board (PS-OSB)

For making prelaminated oriented strand boards, uncoated smooth fine surface oriented strand boards (*see* **3.2**) shall be used. The pre-lamination shall be done with the same process as given in IS 3087 (third revision under preparation and at wide circulation stage. Doc No: CED 20 (26076) WC.

6.3 Veneered Oriented Strand Board (VS-OSB)

For making veneered oriented strand boards, uncoated smooth fine surface oriented strand boards (*see* **3.2**) shall be used. The process of treatment and bonding of veneer(s) shall be done with the same process as given in IS 3087 [third revision under preparation and at wide circulation stage. Doc No: CED 20 (26076) WC].

7 FINISH

7.1 The uncoated oriented strand boards shall be of uniform thickness and uniform density throughout the length and width of the boards. All oriented strand boards shall be flat. In case of smooth-fine surface oriented strand boards, both surfaces of the oriented strand boards shall be sanded to a smooth finish.

7.2 The finish of the lamination shall be of uniform nature. The finish of the paper overlaid board depends on the surface of caul plates used. Common surface finishes in use are glossy, matt, textured (soft, swede, wood pore and leather), etc.

7.3 All veneered oriented strand boards shall be flat and squarely cut.

8 DIMENSIONS AND TOLERANCES

8.1 When tested in accordance with IS 2380 (Part 2), the dimensions of oriente strand boards shall be as follows:

Length, mm : 2 440, 2 140, 1 830, 1 525, 1220, 1 000 and 920

Width, mm : 1 830, 1220, 1000, 920, 610 and 305

Thickness, mm : 6, 8,10, 12, 16, 18, 20, 22, 25 and 30 mm.

NOTE- Any other dimension as agreed to between the purchaser and the manufacturer may be used and the same shall be declared by the manufacture.

8.2 Tolerance on dimensions, edge straightness and squareness of individual panels shall be as given in Table 1.

TABLE 1 REQUIREMENTS FOR DIMENSIONAL TOLERANCES
(*Clauses* 8.2*)*

Sl. No.	**Properties**	**Requirements**	**Method of Test Ref to**
(1)	(2)	(3)	(4)
i)	Tolerance on Length and Width, mm	± 3	IS 2380 (Part 2)
ii)	Tolerance on thickness (sanded/ laminated/ veneered), mm	± 0.3	IS 2380 (Part 2)
iii)	Tolerance on thickness (Unsanded), mm	± 0.8	IS 2380 (Part 2)
iv)	Edge straightness, mm/m, Max.	2.0	IS 2380 (Part 2)
v)	Squareness, mm/m, Max.	2.0	IS 2380 (Part 2)

9 PHYSICAL AND MECHANICAL REQUIREMENTS

9.1 From each of the oriented strand boards selected as in **10.1** following test specimens shall be cut out from portions 150 mm away from the edges for tests as specified in **9** and conditioned as specified in IS 2380 (Part 1).

a) For Determination of Density - Three test specimens 75 mm wide and 150 mm long, in full thickness of board from each sample. Other sizes of specimens may be used when deemed necessary.
b) For Determination of Moisture Content - Three test specimens 75 mm wide and 150 mm long, in full thickness of board from each sample. Smaller specimens may be used when deemed necessary.
c) For Swelling in Water Test - Three test specimens of size 200 mm x 100 mm in full thickness of board from each sample.
d) For Determination of Modulus of Rupture - Three test specimens from each sample as specified in IS 2380 (Part 4).
e) For Determination of Tensile Strength Perpendicular to Surface - Three test specimens of size 50 mm x 50 mm in full thickness of board from each sample.

f) For Determination of Tensile Strength Perpendicular to Surface - After Ageing Test Three test specimens of size 50 mm x 50 mm in full thickness of board from each sample.
g) For Determination of Screw Withdrawal Strength - Three lest specimens from each sample of size as specified in IS 2380 (Part 14).
h) For Determining the Resistance to Abrasion - Three test specimens of size about 130 mm diameter or a square of about 120 mm with its earners rounded to give a diagonal of about 130 mm in full thickness of board from each sample.
j) For Determining the Resistance to Steam - Three test specimens of size 100 mm x 100 mm in full thickness of board from each sample.
k) For Determining the Resistance to Crack - Three test specimens of size 100 mm x 100 mm in full thickness of board from each sample.
m) For Determining the Resistance to Cigarette Burn - Three test specimens of size 200 mm x 10 mm in full thickness of board from each sample.
n) For Determining the Resistance to Stain - Three test specimens of size 75 mm x 25 mm in full thickness of board from each sample.

9.2 Density variation and moisture content of the individual panels shall be within the Tolerance/range stated in Table 2.

TABLE 2 REQUIREMENTS OF DENISTY VARIATION AND MOSITURE CONTENT
(*Clauses* 9.2*)*

Sl. No.	**Property**	**Requirements**	**Method of Test Ref to**
(1)	(2)	(3)	(4)
i)	Density variation within panel, Max.	12 percent from mean	IS 2380 (Part 3)
ii)	Moisture Content, percent	2 -12	IS 2380 (Part 3)

9.3 Mechanical Requirements - All grades (*see* **4.2**) of OSB and S-OSB shall be shall conform to the requirements given in Table 3.

TABLE 3 MECHANICAL REQUIREMENTS FOR ORIENTED STRAND BOARDS
(*Clause* 9.3)

Sl. No.	**Properties**	**Grades (OSB/S-OSB)**	**Requirement Thickness Ranges, mm**			**Method of Test Ref to**
			6≤10	**>10 ≤18,**	**>18 ≤30**	
(1)	(2)	(3)	(4)	(5)	(6)	(7)
i)	Bending Strength, N/mm2 - Major Axis	OSB GP-REG	18	16	14	IS 2380 (Part 4)
		OSB LB-REG	20	18	16	
		OSB LB-MR	20	18	16	
		OSB HLB-MR	27	25	23	
ii)		OSB GP-REG	9	8	7	

Sl. No.	Properties	Grades (OSB/S-OSB)	Requirement Thickness Ranges, mm			Method of Test Ref to
			6≤10	>10 ≤18,	>18 ≤30	
(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Bending Strength, N/mm2 - Minor Axis	OSB LB-REG	10	9	8	IS 2380 (Part 4)
		OSB LB-MR	10	9	8	
		OSB HLB-MR	14	13	12	
iii)	Modulus of Elasticity in bending, N/mm^2 Major Axis	OSB GP-REG	2250	2250	2250	IS 2380 (Part 4)
		OSB LB-REG	3150	3150	3150	
		OSB LB-MR	3150	3150	3150	
		OSB HLB-MR	4300	4300	4300	
iv)	Modulus of Elasticity in bending, N/mm^2 — Minor Axis	OSB GP-REG	1100	1100	1100	IS 2380 (Part 4)
		OSB LB-REG	1200	1200	1200	
		OSB LB-MR	1200	1200	1200	
		OSB HLB-MR	1600	1600	1600	
v)	Internal Bond strength, N/mm^2	OSB GP-REG	0.27	0.25	0.23	IS 2380 (Part 5)
		OSB LB-REG	0.31	0.29	0.27	
		OSB LB-MR	0.31	0.29	0.27	
		OSB HLB-MR	0.45	0.4	0.35	
vi)	Swelling in Thickness, % - 24 h	OSB GP-REG	22	22	22	IS 2380 (Part 17)
		OSB LB-REG	18	18	18	
		OSB LB-MR	13	13	13	
		OSB HLB-MR	11	11	11	
vii)	Bending Strength after cyclic Test, N/ mm^2 – Major Axis (see Note 1)	OSB GP-REG	-	-	-	IS 2380 (Part 4)
		OSB LB-REG	-	-	-	
		OSB LB-MR	7	6	5	
		OSB HLB-MR	12	11	5	
viii)	Internal Bond strength, N/mm2					
	After cyclic test (see Note 1) OR	OSB GP-REG	-	-	-	IS 2380 (Part 5)
		OSB LB-REG	-	-	-	
		OSB LB-MR	0.12	0.10	0.08	
		OSB HLB-MR	0.15	0.13	0.08	
	After accelerated water resistance test (see Note 2)	OSB GP-REG	-	-	-	IS 2380 (Part 5)
		OSB LB-REG	-	-	-	
		OSB LB-MR	0.11	0.10	0.06	
		OSB HLB-MR	0.13	0.11	0.05	
ix)	Screw withdrawal Test Max. Force at Surface	OSB GP-REG	140	220	225	IS 2380 (Part 14)
		OSB LB-REG	160	230	250	
		OSB LB-MR	180	260	260	
		OSB HLB-MR	200	290	290	

NOTES

1 Cyclic test - Specimens is immersed in water at 27 ± 2 °C for a period of 72 h, followed by drying in air at 27 ± 2 °C for 24 h and then heating in dry air at 70 °C for 72 h. Three such cycles is to be followed, and then the specimen are tested for tensile strength perpendicular to surface/ Bending strength.

2 Accelerated water resistance test - Specimens are immersed in water at 27 ± 2 °C and water is brought to boiling and kept at boil in a temperature for 2 h. Specimens are then cooled in water to 27 ± 2 °C and then tested for tensile strength perpendicular to surface/ bending strength.

9.4 Formaldehyde Requirements - All grades (*see* **4.2**) of OSB and S-OSB shall be shall conform to the requirements formaldehyde content and steady-state formaldehyde emission given in Table 4.

TABLE 4 REQUIREMENTS FOR FORMALDEHYDE CONTENT AND STEADY-STATE FORMALDEHYDE EMISSION
(*Clauses* 9.4*)*

Sl. No.	Properties	Requirements	Method of Test Ref to
(1)	(2)	(3)	(4)
i)	Formaldehyde content Fc, mg/100 g for oven dry board	For Formaldehyde Class, E_1: Fc ≤ 8	IS 13745
		For Formaldehyde Class, E_2: 8 < Fc ≤ 30	
ii)	Steady-state formaldehyde emission, Fc, mg/m^3 (optional test)	For Formaldehyde Class, E_1: Fc ≤ 0.124;	IS/ISO 12460 (Part 1)
		For Formaldehyde Class, E_2: Fc > 0.124	

9.5 Additional Tests for Prelaminated Oriented Strand Board (PS-OSB)

The Prelaminated Oriented Strand Board shall conform to the requirements given Table 5.

TABLE 5 REQUIREMENTS OF PRELAMINATED ORIENTED STRAND BOARD (PS-OSB) SURFACE CHARCTERSTICS
(*Clause* 9.5)

Sl No.	Properties	Requirements	Method of Test, Ref to
(1)	(2)	(3)	(4)
i)	Abrasion resistance in number of revolutions, Min,		Annex C of IS 3087 (see Note)
	Type 1	1000	
	Type 2	450	
	Type 3	250	
	Type 4	75	
ii)	Resistance to steam/water vapours	No blister, delamination or change in surface finish	Annex D of IS 3087 (see Note)

Sl No.	Properties	Requirements	Method of Test, Ref to
(1)	(2)	(3)	(4)
iii)	Resistance to crack	No sign of crack or delamination	Annex E of IS 3087 (see Note))
iv)	Resistance to a cigarette burn	No mark or stain on the specimen after cleaning with water or solvent	Annex F of IS 3087 (see Note)
v)	Resistance to stain	No stain on the specimen after cleaning with solvent or detergent	Annex G of IS 3087 (see Note)
NOTE – IS 3087 (third revision under preparation and at wide circulation stage. Doc No: CED 20 (26076) WC			

9.6 Additional Tests for Veneered Oriented Strand Board (VS-OSB)

9.6.1 *Adhesion of Plies* – Three test specimens of 200 mm x 100 mm shall be taken for test. The adhesion of the face veneers to the oriented strand board core and the cross-bands and other veneers, where these exist, shall be such that when tested by forceful opening with a knife, these shall show appreciable resistance and the exposed surface of veneer shall show signs of some adherent fibres distributed more or less uniformly. The knife test is an empirical test and is only indicative and it should, therefore, be carried out with utmost care.

10 SAMPLING AND CRITERIA FOR CRITERIA FOR CONFORMITY

10.1 Sampling

10.1.1 *Lot*

In any consignment, all the oriented strand boards of same classification (*see* **4**) dimension (thickness), and manufactured under similar conditions of production shall be grouped together to constitute a lot.

10.1.2 The conformity of a lot, to the requirements of this standard, shall be ascertained on the basis of tests on oriented strand boards selected from it.

10.1.3 These oriented strand boards shall be selected at random (see IS 4905 for guidance).

10.2 Criteria for Conformity

10.2.1 All the oriented strand boards selected in accordance with **10.1.3** shall be measured for length, width, thickness, edge straightness, and squareness tests. These dimensions shall comply with the requirements specified in **8.1** and **8.2**, before proceeding with further testing.

10.2.2 If all the boards in **10.2.1** are found to be conforming, then from each of the oriented strand boards, the test specimens shall be cut out from portions 150 mm away from the edges for the tests as mentioned in **9**.

10.2.3 A lot shall be considered as conforming to the requirements of this standard, if all the samples and test specimens pass the conditions as prescribed in **8** and **9**.

10.2.4 If any sample fails to conform the requirements, further samples shall be taken from the lot, double in number, and the lot shall be considered to have passed, if these samples conform to the requirements prescribed.

11 ADDITIONAL REQUIREMENTS FOR ECO-MARK

11.1 General Requirement

11.1.1 Oriented strand boards shall conform to the requirement specified in this standard.

11.1.2 The manufacturer shall produce to BIS, the environmental consent clearance from State Pollution Control Board as per the provisions of the Water (Prevention and Control of Pollution) Act, 1974 and Air (Prevention and Control of Pollution) Act, 1981, Water (Prevention and Control of Pollution) Act, 1981 and Water (Prevention and Control or Pollution) Cess Act, 1977 along with the authorization, if required under the Environment (Protection) Act, 1986, while applying for ECO-Mark appropriate with enforced rules and regulations of Forest Department.

11.2 Specific Requirement

Oriented strand boards shall conform to the specific requirements given for ECO-Mark under relevant clauses of this standard.

12 MARKING

12.1 Each oriented strand board shall be legibly and indelibly marked with the following particulars either by direct printing or by an adhesive label or by any other means.

a) Name of the manufacturer or trademark,
b) Product (examples – OSB/S-OSB/PS-OSB/VS-OSB) (see **3**)
c) Classification (see *4*)
d) Formaldehyde class
e) Size and Thickness
f) Batch number and
g) Date of manufacturing
h) The criteria for which the prelaminated oriented strand board has been labelled as ECO-Mark (in case the board has been marked with ECO-Mark) (see Foreword).

12.2 BIS Certification Marking

The oriented strand boards may also be marked with the Standard Mark.

The product(s) may be marked with Standard Mark as per the conformity assessment

schemes governed by the provisions of the Bureau of Indian Standards Act, 2016 and the Rules and Regulations made there under. The details of the conditions for the license may be obtained from the Bureau of Indian Standards.

ANNEX A

(*Clause* 2)

LIST OF REFERRED INDIAN STANDARDS

IS No.	***Title***
IS 707: 2011	Timber technology and utilization of wood, bamboo and cane – Glossary of terms (third revision)
IS 848:2006	Synthetic resin adhesives for plywood (Phenolic And Aminoplastic) - Specification *(Second Revision)*
IS 2380 (Part 1) : 1977 (Part 2) : 1977 (Part 3) : 1977 (Part 4) : 1977 (Part 5) : 1977 (Part 14) : 1977 (Part 17) : 1977	Methods of test for wood particle boards and boards from other lignocellulosic materials: Preparation and conditioning of test specimens (*first revision*) Accuracy of dimensions of boards (*first revision*) Determination of moisture content and density (*first revision*) Determination of static bending strength (modulus of rupture and modulus of elasticity in bending) (*first revision*) Determination of tensile strength perpendicular to the surface (*first revision*) Screw and nail withdrawal test (*first revision*) Determination of swelling in water (*first revision*) Screw And Nail Withdrawal test Determination of Water absorption
IS 3087 (*revision under preparation*); Doc No: CED 20 (26076) WC	Particleboards of Wood and Other Lignocellulosic Materials – Specification (*third revision of IS 3087; Amalgamating IS 3097 and IS 12823*)
IS 4905: 2015/ ISO 24153: 2009	Random sampling and randomization procedures (*first revision*)
IS13745: 2020	Method for determination of formaldehyde content in wood-based panels by extraction method called perforator method (*first revision*)
IS/ISO 12460 (Part 1) : 2007	Wood-based panels – Determination of formaldehyde release: Part 1 Formaldehyde emission by the 1-cubic meter chamber method

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