भारतीय मानक **IS 303 : 2024**

Indian Standard

सामान्य प्रयोजन के लिए प्लाईवुड — विशिष्टि

(चौथा पुनरीक्षण)

Plywood for General Purposes — Specification

(Fourth Revision)

ICS 79.060.10

भारतीय मानक ब्यूरो
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February 2024 **Price Group 7**

Wood and Other Lignocellulosic Products Sectional Committee, CED 20

FOREWORD

This Indian Standard (Fourth Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Wood and Other Lignocellulosic Products Sectional Committee had been approved by the Civil Engineering Division Council.

The standard requirements for general purpose plywood was first published in 1951, which was then revised in 1960, 1975 and 1989. In the second revision, for grades of plywood band on the adhesive type used and ten types of plywood band on the visual on features of the face and back of the plywood were introduced, thereby providing a total of 40 clauses. In the third revision of the standard, BWR and CWR Grades of plywood were deleted and the WWR Grade plywood was replaced with MR Grade. Further, band on appearance, only 3 Types of plywood were retained then.

In this revision, the following major modifications have been incorporated:

a) Material clause for timber has been modified;

b) BWP (Boiling Water Proof) Grade has been added;

c) The clause on extender has been modified;

d) Dimension related clause has been modified;

e) Mycological test is now applicable for all grades;

f) Modulus of Rupture (MOR) and Modulus of Elasticity (MOE) requirements have been modified;

g) Requirements for formaldehyde content for oven dry board and the steady-state formaldehyde emission (optional) have been added;

h) Marking clause has been modified; and

j) All amendments to the previous version have been incorporated.

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 21 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 additional environment friendly requirements. For this purpose, the Standard Mark of BIS would be a single mark being a combination of the ISI Mark and the ECO-Mark. 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 is 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.

This standard contributes to the United Nations Sustainable Development Goal 9 ‘Industry innovation and infrastructure’ Build resilient infrastructure promote inclusive and sustainable industrialization and foster innovation.

The composition of the Committee responsible for the formulation of the standard is given in Annex D.

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.

Indian Standard

PLYWOOD FOR GENERAL PURPOSES — SPECIFICATION

(Fourth Revision)

1 SCOPE

This standard covers the requirements of plywood used for general purposes.

2 REFERENCES

The standards listed in Annex A contain provisions which through reference in the text, constitute 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 edition of these standards.

3 TERMINOLOGY

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

4 GRADES AND CLASS

4.1 Plywood for general purposes shall be of the following three grades, depending upon the bond strength developed by the adhesive used for bonding the veneers:

a) MR (Moisture Resistant) Grade;

b) BWR (Boiling Water Resistant) Grade; and

c) BWP (Boiling Water Proof) Grade.

4.2 In terms of formaldehyde class, each grade of plywood shall be further classified in two classes as follows:

a) Formaldehyde Class, E_1

b) Formaldehyde Class, E_2

4.3 These shall be manufactured in accordance with **7.1** and **7.2**. The grades shall conform to the general and workmanship requirements given in **8** and **9** respectively, and the test requirements laid down in **11**.

5 TYPES BASED ON CLASSIFICATION BY APPEARANCE

5.1 Plywood for general purposes shall be classified into three types, namely, AA, AB and BB based on the quality of the two surfaces, namely, A and B in terms of general permissible defects. The type of plywood shall, therefore, be designated by the kind of surfaces of the panels. The better quality surface shall be called 'face (top)', and the opposite side shall be called 'back (bottom)'. If the face (top) and the back (bottom) are of the same quality, they are not distinguished. The type of plywood shall denote first the quality of face (top) followed by the quality of back (bottom). For example, Type AA shall have both surfaces of quality A, Type AB shall have face (top) of quality A and the back (bottom) of quality B and Type BB shall have both the surfaces of quality B.

5.2 The quality requirement of each of the surfaces mentioned under **5.1**, shall conform to the requirements given in Table 1. However, the maximum number of categories of defects permitted on any one surface of the panel shall be restricted in accordance with the requirements laid down in Table 2.

6 MATERIALS

6.1 Timber

Any species of timber may be used for manufacturer of plywood. It is recommended to use wood from sources other than natural forests includes, Tree Outside Forest (TOF), rubber, coconut, cashew, walnut, agro forestry, farm forestry, industrial and social forestry plantations, etc and shade trees from tea and coffee estates in plywood manufacturing. A list of timber species is given in Annex B for guidance purpose. Imported timber may also be used in manufacturing of plywood.

6.2 Adhesive

Any suitable type of synthetic resin adhesive may be used for bonding the veneers in different grades of plywood comply with requirements as per the respective grades (*see* **4.1**) of plywood. For type of synthetic resin adhesive to use refer IS 848.

6.2.1 Extenders may be used with synthetic resin adhesive (aminoresins). However, when extender used with synthetic resin adhesives (aminoresins) by more than 12 percent, shall contain suitable preservative chemicals in sufficient concentration to satisfy the mycological test described in **11.3.2**.

Table 1 Quality Requirements of Surfaces of Plywood for General Purposes

(*Clause* 5.2)

Sl No.	Defect Categories	Type of Surfaces	
		A Type	B Type
(1)	(2)	(3)	(4)
i)	Blister	Nil	Nil
ii)	Checks	Individual check not more than 50 mm in length and the total length not more 300 mm/m^2 area	Individual check not more than 100 mm in length and the total length not more 1 000 mm/m^2 area
iii)	Discolouration	Nil	5 percent
iv)	Dote	5 cm/m^2	15 cm/m^2
v)	Insect hole	Scattered up to 12 holes/m^2	Scattered up to 24 holes/m^2
vi)	Joints	One joint for every multiple of 200 mm, provided no individual piece is less than 100 mm in width	No restriction
vii)	Knots (dead)	2 up to 12 mm dia/m^2	4 up to 20 mm dia/m^2
viii)	Pin knots (dead)	2/m^2	6/m^2
xi)	Pin knots (live)	No restriction	No restriction
x)	Knots (tight)	6 up to 25 mm dia/m^2	No restriction
xi)	Patches	4 patches/m^2, provided they are all tight patches and do not mar the appearance	Any number, provided they are all tight patches and do not mar the appearance
xii)	Splits	2 splits, each not more than 1 mm wide and length not more 100 mm, provided they are filled with suitable filler	3 splits, each not more than 4 mm wide and length not more 150 mm, provided they are filled with suitable veneer inserts. Splits up to 25 mm long and 0.8 mm wide may be ignored, provided they are suitably filled with a filler
xiii)	Swirl	Unlimited, provided they do not mar the appearance	No restriction

Table 2 Permissible Categories of Defects

(*Clause* 5.2)

Sl No.	Type of Surface	Maximum Number of Categories of Permissible Defects, per m^2
(1)	(2)	(3)
i)	A type	3
ii)	B type	5

7 MANUFACTURE

7.1 The veneers for all the grades shall be either rotary cut or sliced. The veneers shall be sufficiently smooth to permit an even spread of adhesive. Treatment as specified in 7.1.1 shall be given to the plywood either at the veneer stage or after converting the veneers into boards.

7.1.1 *Treatment*

7.1.1.1 Veneers from non-durable species and sapwood of all species, when used for plywood manufacture shall be soaked in 1.25 percent solution of boric acid or 1.9 percent solution of borax at a temperature of 85 °C to 90 °C for a period of 10 min to 40 min depending upon the thickness of the veneers, or the veneers may be dipped in 2 percent solution of boric acid or 3 percent borax solution for 2 min and block stacked at least for 2 h. Alternatively, the veneers may be soaked at an ambient temperature in a mixture of 0.5 percent solution of sodium peotachlorophenate and 1.5 percent of borax in water, for a period of 2 min and then stacked for at least half an hour before drying.

7.1.1.2 For BWR and BWP Grade of plywood bonded with synthetic resin adhesive, the preservative may be given conveniently after boards come out of the press, while still hot or the treatment given to the veneers before bonding.

7.1.1.3 For BWR and BWP Grade, fixed type of preservative may be used subject to the agreement between the manufacturer and the user according to IS 5539.

7.1.1.4 Any other type of treatment may also be given to plywood or veneer as per agreement between the manufacturer and the purchaser, or as declared by the manufacturer.

7.2 Assembly

7.2.1 *Thickness*

The thickness of all veneers shall be uniform within a tolerance of ± 5 percent. Corresponding veneers on either side of the central ply and those of face (top) and back (bottom) veneers shall be of species having similar physical and mechanical properties, such as, density, modulus of elasticity, shrinkage, etc to ensure balanced construction. The examples of balanced construction for odd number of plies are as follows:

a) 3 Ply — XXX or XYX; and

b) 5 Ply — XXXXX or XYYYX or XYZYX.

where

X, Y, Z represents species used for top/bottom and centre.

7.2.2 *Joints in Veneers*

Veneers that require to be joined to form a ply shall be spliced (edge jointed) before assembly. All joints shall be cut square. They may be taped on the face of the outer veneers in which case the tape shall be removed at a later stage, and metal clips or staples, if used, shall be removed. Perforated tapes may be used on the glue side of the veneers. In assembly, joints in veneers running in the same direction shall be staggered. End joints and butt joints shall not be permitted for any of the surfaces.

7.2.3 *Grain Direction*

Unless otherwise specified by the purchaser and except in boards comprising an even number of plies, the direction of grain of the veneer in adjacent plies shall be at right angles to each other, and that of the outer plies shall run parallel to the longer side of the board. In boards comprising even number of plies, the grain of the centre pair shall follow the same direction. In adjacent plies, the grain should be at right angles to each other. However, a deviation not exceeding 10° may be permitted. In all cases, the grain on both faces of the assembly boards shall run in the same direction.

7.2.4 *Scarf Joints*

When sizes larger than the available press sizes are required, scarf joints through the thickness of the board are permitted. All scarf joints shall be bonded with the same or a better adhesive than the one used for the manufacture of plywood, and shall be made with an inclination not greater than 1 in 12.

7.2.5 *Permissible Defects*

7.2.5.1 Gaps in cores and cross-bands may be permitted except for 3 ply plywood, provided the width of the gap does not exceed 1 mm in case of 5 ply and 2 mm in case of plywood of more than 5 ply and provided such gaps, if more than one, shall be spaced not less than 80 mm away from each other and are staggered not less than 50 mm away as between ply, the next ply having the same grain direction.

7.2.5.2 Splits in cores and cross-bands may be permitted to an extent of 2 per core or cross-band.

7.2.5.3 Overlap shall not be permitted.

8 DIMENSIONS AND TOLERANCES

8.1 Any dimensions (length and width) and number of ply as agreed to between the manufacturer and the purchaser may be used and shall be declared by the manufacturer. Prevailing dimensions (length × width) of plywood boards are as given below:

a) 2 440 mm × 1 220 mm;
b) 2 135 mm × 1 220 mm;
c) 2 135 mm × 915 mm;
d) 1 830 mm × 1 220 mm; and
e) 1 830 mm × 915 mm

8.2 Thickness

The thickness of the plywood boards shall be 3 mm, 4 mm, 5 mm, 6 mm, 9 mm, 12 mm, 15 mm, 19 mm, 22 mm and 25 mm.

NOTE — Any other thickness as agreed to between the manufacturer and the purchaser may also be used.

8.3 Squareness and Edge Straightness

Edge straightness and squareness shall be tested as per Annex C.

8.4 Tolerances

The tolerances on the dimensions of finished plywood boards shall be as given in Table 3.

Table 3 Tolerances on Dimensions of Plywood for General Purposes

(*Clause* 8.4)

Sl No.	Dimension	Tolerance
(1)	(2)	(3)
i)	Length	+ 6 mm – 3 mm
ii)	Width	+ 3 mm – 1 mm
iii)	Thickness	
	a) less than 6 mm; and	± 10 percent
	b) 6 mm and above	± 5 percent
iv)	Squareness, *Max*	2 mm/1 000 mm or 0.2 percent
v)	Edge straightness, *Max*	2 mm/1 000 mm or 0.2 percent

9 WORKMANSHIP AND FINISH

9.1 The plywood shall be of uniform thickness within the tolerance limits specified under 8.3.

9.2 The faces of finished plywood shall be reasonably smooth. Slight sanding may be given to rough plywood boards in order to make them reasonably smooth.

10 SAMPLING AND CRITERIA FOR CONFORMITY

The method of drawing representative samples and the criteria for conformity shall be as prescribed in IS 7638.

11 PHYSICAL AND MECHANICAL REQUIREMENTS

11.1 The plywood shall conform to the requirements given in 11.3 to 11.6.

11.2 Unless otherwise specified in this standard, six test specimens, cut from each of the plywood selected as in 10 shall be subjected to tests specified in 11.3 to 11.5. For formaldehyde content and steady-state formaldehyde emission test, specimens shall be taken as per IS 13745 and IS/ISO 12460 (Part 1) respectively.

11.3 Glue Adhesion

Glue adhesion shall be deemed satisfactory if the plywood complies with the requirements specified in 11.3.1 and 11.3.2.

11.3.1 *Water Resistance Test*

Plywood for general purposes of either grade (*see* 4.1), when tested in the manner specified below shall satisfy the minimum pass standard for test for adhesion of plies as given in IS 1734 (Part 5).

11.3.1.1 Three test specimens of size 250 mm × 100 mm with full thickness of plywood shall be prepared from each of the boards selected under 10 and shall be tested for respective grade as described below.

a) *For MR Grade* — Specimens shall be submerged in water at a temperature of 60 °C ± 2 °C for 3 h and dried for 8 h at a temperature of 65 °C ± 2 °C. Such cycle of submergence and drying shall be followed by two more cycles. The specimens shall then be tested in accordance with the method given in IS 1734 (Part 5).

b) *For BWR Grade* — Specimens shall be submerged in boiling water for 8 h and then dried for 16 h at a temperature of 65 °C ± 2 °C. Such cycle of submergence and drying shall be followed by two more cycles. The specimens shall then be tested in accordance with the method given in IS 1734 (Part 5).

c) *For BWP Grade* — The specimens shall be kept submerged in a pan of boiling water for a period of 72 h. The period of 72 h of boiling may be a continuous period or an aggregate of smaller periods of boiling, if the test piece is left in cold water between these smaller periods. These test pieces shall then be removed from the boiling water and cooled down to room temperature by plunging them in cold water. These test specimens, while still in wet condition, shall be tested in accordance with the method given in IS 1734 (Part 5).

NOTE — The cycles of drying or soaking can be made up of a number of shorter periods of drying or soaking. In such instances the specimen shall be kept in air at 27 °C ± 2 °C in between the shorter periods constituting the drying cycle, and be kept submerged in water at 27 °C ± 2 °C in between the shorter periods constituting the soaking cycle.

11.3.2 *Mycological Test*

Plywood when tested in accordance with the method given in IS 1734 (Part 7) shall satisfy minimum pass standard for test for adhesion of plies as given in IS 1734 (Part 5).

11.4 Moisture Content

The plywood when tested in accordance with IS 1734 (Part 1) shall have a moisture content not less than 5 percent and not more than 15 percent.

11.5 Static Bending Strength

Three test specimens taken in each direction from the sample of plywood, when tested in accordance with IS 1734 (Part 11) shall have an average and a minimum individual modulus of elasticity and modulus of rupture not less than the values specified in Table 4 against each grade.

This test is applicable only for plywood of thickness 6 mm and above.

Table 4 Average and Minimum Individual Values of Modulus of Elasticity (MOE) and Modulus of Rupture (MOR)

(*Clause* 11.5)

Sl No.	Grade	MOE (N/mm^2)		MOR (N/mm^2)	
		Average	*Min*	*Average*	*Min*
(1)	(2)	(3)	(4)	(5)	(6)
i)	MR Grade:				
	a) Along [direction parallel to the grain direction of the face (top) veneer]; and	3 400	3 100	26	23
	b) Across [direction perpendicular to the grain direction of the face (top) veneer]	2 300	2 100	17	15
ii)	BWR Grade and BWP Grade:				
	a) Along [direction parallel to the grain direction of the face (top) veneer]; and	4 300	3 800	34	31
	b) Across [direction perpendicular to the grain direction of the face (top) veneer]	2 900	2 500	23	21

11.6 Formaldehyde Content Test

Test of free formaldehyde content in the sample shall be done by perforator method as per IS 13745 and test results of drawn sample shall meet the requirements of formaldehyde content as follows:

a) Formaldehyde Class, E_1 — $\leq$ 8 mg/ 100 g of oven dry sample; and

b) Formaldehyde Class, E_2 — > 8 mg/100 g of oven dry sample and $\leq$ 30 mg/100 g of oven dry sample.

11.7 Steady-State Formaldehyde Emission Test (Optional Test)

Manufacturer will offer a stack of plywood made under a batch (not less than 50 pieces) bearing the batch number and date of manufacture along with details of plywood, that is, grade, size and thickness, adhesive used and any other (the manufacture wish to inform). After sampling, the sample shall immediately cover in airtight polythene with date of sampling on the plywood.

Sample must be taken for test within 24 h of opening the airtight cover and within one month from the date of sampling, and test shall be done by the test method as given in IS/ISO 12460 (Part 1). The test results of drawn sample shall meet the requirements of formaldehyde emission value as follows:

a) Formaldehyde Class, E_1 — $\leq$ 0.124 mg/m^3; and

c) Formaldehyde Class, E_2 — > 0.124 mg/m^3.

11.8 Other Tests

For testing any other mechanical property of general purpose plywood, subject to agreement between the purchaser and the supplier, reference shall be made to the provisions of IS 1734 (Part 1 to Part 20).

11.9 Retest

If the samples selected as specified in 10 are found not to be fully complying with the requirements of 11.3 to 11.6, a further similar set of samples shall be taken at random from the same batch and subjected to the tests. If any of the samples in the second set is also found not to comply fully with the requirements of test, all the plywood in the batch represented by the samples shall be rejected.

12 ADDITIONAL REQUIREMENTS FOR ECO-MARK

12.1 General Requirement

12.1.1 Plywood shall conform to the requirement specified in this standard.

12.1.2 The manufacturer shall produce to Bureau of Indian Standards, 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 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.

12.2 Specific Requirement

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

NOTE — The manufacturer shall provide documentary evidence by way of certificate or declaration to Bureau of Indian Standards, while applying for ECO-Mark.

13 MARKING

13.1 Each plywood shall be legibly and indelibly marked or stamped with the following:

a) Manufacturer's name and his initials or his recognized trade-mark, if any;

b) In words 'PLYWOOD FOR GENERAL PURPOSE';

c) The Grade and Type as follows:

1) BWP/AA, BWP/AB, BWP/BB;

2) BWR/AA, BWR/AB, BWR/BB; and

3) MR/AA, MR/AB, MR/BB;

d) Formaldehyde Class;

e) Nominal length, width and thickness of plywood;

f) Month and year of manufacture;

g) Batch No.; and

h) Criteria for which the plywood has been labelled as ECO-Mark (if applicable).

13.2 Following additional information may be marked on each plywood:

a) Number of plies; and

b) Trade name of timber species used in manufacturing of plywood (*see* IS 1150).

13.3 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 there under, and the products may be marked with the Standard Mark.

14 DELIVERY

Unless otherwise specified, the plywood boards shall be delivered in a clean condition and shall be suitably packed according to normal trade. For ECO-Mark the material used for packaging of the plywood shall be recyclable, reusable or biodegradable.

ANNEX A

(*Clause* 2)

LIST OF REFERRED 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 1150 : 2000	Trade names and abbreviated symbols for timber species (*third revision*)
IS 1734	Methods of test for plywood:
(Part 1) : 1983	Determination of density and moisture content (*second revision*)
(Part 2) : 1983	Determination of resistance to dry heat (*second revision*)
(Part 3) : 1983	Determination of fire resistance (*second revision*)
(Part 4) : 1983	Determination of glue shear strength (*second revision*)
(Part 5) : 1983	Test for adhesion of plies (*second revision*)
(Part 6) : 1983	Determination of water resistance (*second revision*)
(Part 7) : 1983	Mycological test (*second revision*)
(Part 8) : 1983	Determination of *p*H value (*second revision*)
(Part 9) : 1983	Determination of tensile strength (*second revision*)
(Part 10) : 1983	Determination of compressive strength (*second revision*)
(Part 11) : 1983	Determination of static bending strength (*second revision*)
(Part 12) : 1983	Determination of scarf joint strength (*second revision*)
(Part 13) : 1983	Determination of panel shear strength (*second revision*)
(Part 14) : 1983	Determination of plate shear strength (*second revision*)
(Part 15) : 1983	Central loading of plate test (*second revision*)
(Part 16) : 1983	Vibration of plywood plate test (*second revision*)
(Part 17) : 1983	Long time loading test of plywood strips (*second revision*)
(Part 18) : 1983	Impact resistance test (*second revision*)
(Part 19) : 1983	Determination of nails and screw holding power (*second revision*)
(Part 20) : 1983	Acidity and alkalinity resistance test (*second revision*)
IS 5539 : 1969	Specification for preservative treated plywood
IS 7638 : 1999	Wood/lignocellulosic based panel products — Methods of sampling (*second revision*)
IS/ISO 12460-1 : 2007	Wood based panels — Determination of formaldehyde release: Part 1 Formaldehyde emission by the 1-cubic-metre chamber method
IS 13745 : 2020	Method for determination of formaldehyde content in wood-based panels by extraction method called perforator method (*first revision*)

ANNEX B

(*Clause* 6.1)

LIST OF PREVALENT TREE OUTSIDE FOREST (TOF) SPECIES FOR PLYWOOD

Sl No.	*Botanical Name*	*Trade Name*	*Abbreviation*
(1)	(2)	(3)	(4)
i)	*Acrocarpus fraxinifolius*	Mundani	MUN
ii)	*Ailanthus spp.*	Maharukh	MAH
iii)	*Albizia chinensis Merr.*	Siris	SIR
iv)	*Alstonia scholaris*	Chatian	CHT
v)	*Anacardium occidentale*	Cashew	CAH
vi)	*Bischofia javanica*	Uriam	URI
vii)	*Chukrasia tabularis*	Chickrassy	CHI
viii)	*Delonix spp.*	Gulmohur	GUM
ix)	*Duabanga grandiflora*	Lampati	LAP
x)	*Eucalyptus*	Eucalyptus	EUC
xi)	*Grevillea robusta*	Silver oak	SOA
xii)	*Hevea brasiliensis*	Rubber wood	RUB
xiii)	*Khaya spp.*	Lambu	LAB
xiv)	*Leucaena leucocephala*	Subabul	SUB
xv)	*Macaranga spp.*	Vatta	MCR
xvi)	*Maesopsi seminii*	Umbrella tree	UMB
xvii)	*Melia azedarach Linn.*	Bakain	PLI
xviii)	*Melia composita/dubia*	Malabar neem	MNE
xix)	*Neolamarckea cadamba*	Kadam	KAD
xx)	*Pinus spp.*	Pine	PNE
xxi)	*Populus spp.*	Poplar	POP
xxii)	*Samanea saman*	Saman	SAM
xxiii)	*Toona ciliata*	Toon	TOO
xxiv)	*Swietenia spp.*	Mahogony	MAG

ANNEX C

(*Clause* 8.3)

METHOD OF TEST FOR SQUARENESS AND EDGE STRAIGHTNESS

C-1 PROCEDURE FOR EDGE STRAIGHTNESS

The straightness of the edges and ends of plywood shall be verified against a straightedge not less than the full length of the plywood. If the edge on the end of plywood is convex, it shall be held against the straightedge in such a way that also gives approximately equal gap at each end. The largest gap between the straightedge and the edge shall be measured to the nearest millimetre and recorded.

C-2 PROCEDURE FOR SQUARENESS

The squareness of plywood shall be checked with a 1 200 mm × 1 200 mm square, by applying, one arm of the square to the plywood. The maximum width of the gap shall be recorded.

ANNEX D

(*Foreword*)

COMMITTEE COMPOSITION

Wood and Other Lignocellulosic Products Sectional Committee, CED 20

Organization	*Representative(s)*
Institute of Wood Science & Technology, Bengaluru	DR M. P. SINGH **(*Chairperson*)**
Balaji Action Buildwell, New Delhi	SHRI RAJESHWAR NAIR SHRI VIVEK JAIN (*Alternate*)
Bamboo Society of India, Bengaluru	SHRI PUNATI SRIDHAR DR S. R. SHUKLA (*Alternate* I) DR JAGADISH VENGALA (*Alternate* II)
Central Building Research Institute, Roorkee	SHRIMATI HEMALATA DR JEESHAN KHAN (*Alternate* I) SHRI PRASANTA KAR (*Alternate* II)
Central Institute of Coir Technology, Bengaluru	DR O. L. SHANMUGASUNDARAM SHRIMATI SUMY SEBASTIAN (*Alternate*)
Central Public Works Department, New Delhi	CHIEF ENGINEER (CSQ) SUPERINTENDENT ENGINEER (TAS) (*Alternate*)
Century Plyboard India Ltd, Kolkata	SHRI AJAY BALDAWA SHRI JAGANNATH DAS (*Alternate*)
CSIR - Advance Materials and Processes Research Institute (AMPRI), Bhopal	DR ASOKAN PAPPU
Federation of Indian Plywood & Panel Industry, New Delhi	DR C. N. PANDEY SHRI JAYDEEP CHITLANGIA (*Alternate*)
Greenpanel Industries Limited, Tirupati	SHRI SUBHASH KUMAR AGARWAL DR PURSHOTTAM (*Alternate*)
Greenply Industries Ltd, Kolkata	SHRI ARABINDA SAHA
Institute of Wood Science & Technology, Bengaluru	SHRI ANAND NANDANWAR MS SUJATHA D. (*Alternate*)
Mutha Industries, Agartala	SHRI NEERAJ MUTHA SHRI ANIL MUTHA (*Alternate*)
National Test House, Kolkata	DR SOMIT NEOGI SHRI S. PANERIA (*Alternate*)
The South Indian Plywood Manufacturers Association, Chennai	SHRI MOIZ VAGH
The Western India Plywood Limited, Kannur	SHRI P. K. MAYAN MOHAMED DR E. SREENIVASAN (*Alternate*)
Timpack Private Limited, Byrnihat	SHRI INDER PAL SINGH BHUSRI SHRI ANGAD SINGH BHUSRI (*Alternate*)

Organization	*Representative(s)*
Wood Technology Association, Yamuna Nagar	SHRI S. C. JOLLY
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This Indian Standard has been developed from Doc No.:CED 20 (22829).

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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Published by BIS, New Delhi