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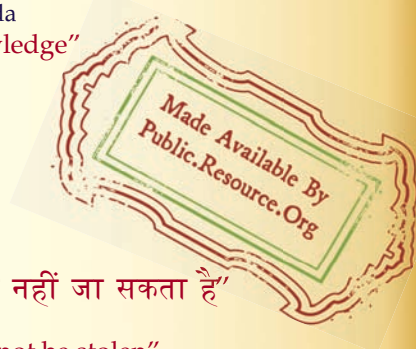
IS 1331 (1971): cut sizes of timber [CED 9: Timber and Timber Stores]



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Indian Standard
SPECIFICATION FOR
CUT SIZES OF TIMBER
(*Second Revision*)

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Indian Standard

SPECIFICATION FOR CUT SIZES OF TIMBER (*Second Revision*)

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Indian Standard
SPECIFICATION FOR
CUT SIZES OF TIMBER
(*Second Revision*)

0. FOREWORD

0.1 This Indian Standard (Second Revision) was adopted by the Indian Standards Institution on 25 November 1971, after the draft finalized by the Timber Sectional Committee had been approved by the Civil Engineering Division Council.

0.2 The need for an Indian Standard specification for cut sizes of timber is in the interests of both producers and stockists on the one hand and consumers on the other. Every saw mill would produce a certain amount of timber in odd sizes, by way of salvage from what would otherwise be wasted in the course of normal timber conversion. While these odd sizes may find a use, this standard would refer only to those sizes which experience has shown to be in general demand for use in building and other purposes. The object of this standard is to channelize the demand for timber and thus help in timber being stocked in suitable sizes and in making it readily available to the consumer for the use both for structural and non-structural purposes.

0.3 This standard was first published in 1958 and revised in 1966. In the second revision grading requirements have been included which were earlier covered in IS: 1629-1960*, and which is being withdrawn.

0.4 In the formulation of this standard due weightage has been given to the practices being followed in this field in this country.

0.5 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:2-1960†. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

*Rules for grading of cut sizes of timber (*withdrawn*).

†Rules for rounding off numerical values (*revised*).

1. SCOPE

1.1 This standard covers specification of converted timber normally stocked in timber depot both for structural and non-structural purposes. It refers to cut sizes of timber as stocked and does not take into consideration any reduction or allowance relating to subsequent use.

2. TERMINOLOGY

2.1 For the purpose of this standard, the definitions given in IS : 707-1968* shall apply.

3. DIMENSIONS AND TOLERANCES

3.1 Cut sizes of timber shall be grouped in terms of width and thickness or sectional area into four groups, namely, (a) batten, (b) plank, (c) scantling, and (d) baulk, as defined in IS : 707-1968*.

3.2 The nominal sizes of width and thickness of cut sizes of timber shall be as given in Table 1. The preferred sizes are marked with 'X'. The preferred sizes for structural purposes for the various uses have been separately covered in IS : 4891-1968†.

3.2.1 The sizes of cut timber specified in Table 1 are at a moisture content of 20 percent. A method for adjustment of dimensions at different moisture contents is given in Appendix A.

NOTE — Other sizes may be produced or stocked to meet specific demands or to ensure full utilization of the log or its off cuts.

3.3 Length — The preferred length of cut sizes of timber shall be 50 cm and upwards in steps of 10 cm.

3.4 The measurement of length, width and thickness of cut sizes of timber shall be made on mid line of the surface on which it is measured.

3.5 Tolerance

3.5.1 Permissible tolerances on cut sizes of timber shall be as follows:

a) For width and thickness:

1) Up to and including 100 mm $\begin{matrix} +3 \\ -0 \end{matrix}$ mm

2) Above 100 mm $\begin{matrix} +6 \\ -3 \end{matrix}$ mm

b) For length $\begin{matrix} +25 \\ -0 \end{matrix}$ mm

*Glossary of terms applicable to timber and timber products (*first revision*).

†Preferred cut sizes of structural timbers.

3.5.2 Where the width or thickness of timber varies by more than 5 percent of its nominal size at any point in its length, the piece shall be deemed to be miscut and, therefore, shall not be in accordance with this specification.

3.5.3 In a given lot, the negative variation [see 3.5.1 (a) (ii)] shall not exceed by more than 10 percent of the lot.

TABLE 1 SIZES OF CUT TIMBER FOR STOCKING PURPOSES

(*Clauses 3.2 and 3.2.1*)

All measurements in centimetres.

THICK- NESS	WIDTH														
	4·0	5·0	6·0	8·0	10·0	12·0	—	—	—	—	—	—	—	—	—
1·0	4·0	5·0	6·0	8·0	10·0	12·0	—	—	—	—	—	—	—	—	—
1·5	×	×	×	×	×	×	14·0	16·0	18·0	—	—	—	—	—	—
2	×	×	×	×	×	×	×	×	×	20·0	22·0	24·0	—	—	—
2·5	×	×	×	×	×	×	×	×	×	×	×	×	26·0	28·0	30·0
3	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
4	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
5	—	×	×	×	×	×	×	×	×	×	×	×	×	×	×
6	—	—	—	×	×	×	×	×	×	×	×	×	×	×	×
8	—	—	—	×	×	×	×	×	×	×	×	×	×	×	×
10	—	—	—	—	×	×	×	×	×	×	×	×	×	×	×
12	—	—	—	—	—	×	×	×	×	×	×	×	×	×	×
14	—	—	—	—	—	—	—	×	×	×	×	×	×	×	×
16	—	—	—	—	—	—	—	×	×	×	×	×	×	×	×
18	—	—	—	—	—	—	—	—	×	×	×	×	×	×	×
20	—	—	—	—	—	—	—	—	—	×	—	—	—	—	—

× = preferred size of the width.

4. GRADING OF CUT SIZES OF TIMBER

4.1 Cut sizes of timber shall be graded after seasoning at a moisture content not less than 12 percent.

4.1.1 Cut sizes shall be graded separately according to end uses, namely, structural and non-structural purposes.

4.2 Grading for Structural Use — Based on permissible and prohibited defects (*see 5.2*) the cut sizes of timber for structural use shall be of three grades, namely, Grade 1, Grade 2 and Grade 3.

NOTE — The approximate cumulative effects due to permissible defects for reducing the basic strength of timber in these three grades are generally as indicated below:

- a) *Grade 1* — The estimated effect in reduction of the basic strength of timber is not more than 12.5 percent.
- b) *Grade 2* — The estimated effect in reduction of the basic strength of timber is not more than 25 percent.
- c) *Grade 3* — The estimated effect in reduction of the basic strength of timber is not more than 37.5 percent.

4.3 Grading for Non-Structural Use — Based on permissible and prohibited defects (*see 5.3*) cut sizes of timber for non-structural use shall be of two grades, namely, Grade 1 and Grade 2.

5. DEFECTS

5.1 In cut sizes of timber, different defects named in 5.2 and 5.3 may occur simultaneously and may be permitted provided they do not exceed the limits specified for the grades. If one requirement specified for a grade is not fully met with, cut size shall be taken to belong to the next lower grade only, even though all other requirements are fulfilled.

5.2 Structural Use

5.2.1 Defects Prohibited — Loose grains, splits, compressive wood in coniferous timber, heart wood rot, sap rot, warp, worm holes made by powder post beetles and pitch pockets shall not be permitted.

5.2.2 Permissible Defects — Defects to the extent specified in Table 2 shall be permissible. The defects shall be measured as given in IS : 3364-1965*.

5.3 Non-Structural Use

5.3.1 Defects Prohibited — Heart wood rot, sap rot, brashness, shakes, insect attack shall not be permitted.

5.3.2 Permissible Defects — Defects to the extent specified in Table 3 shall be permissible. The defects shall be measured as given in IS : 3364-1965*.

*Methods of measurement and evaluation of defects in timber.

TABLE 2 PERMISSIBLE DEFECTS FOR CUT SIZES OF TIMBER FOR STRUCTURAL USE

(Clause 5.2.2)

Sl. No.	DEFECTS	GRADE 1		GRADE 2		GRADE 3	
i)	Wane	Shall be permissible at its deepest portion up to a limit of 1/8 of the width of the surface on which it occurs		Shall be permissible at its deepest portion up to a limit of 1/6 of the width of the surface on which it occurs		Shall be permissible at its deepest portion up to a limit of 1/4 of the width of the surface on which it occurs	
ii)	Worm holes	Other than those due to powder post beetles, are permissible		Other than those due to powder post beetles, are permissible		Other than those due to powder post beetles, are permissible	
iii)	Slope of grain	Shall not be more than 1 in 20		Shall not be more than 1 in 15		Shall not be more than 1 in 12	
iv)	Live knots	PERMISSIBLE MAXIMUM SIZE OF LIVE KNOT ON		PERMISSIBLE MAXIMUM SIZE OF LIVE KNOT ON		PERMISSIBLE MAXIMUM SIZE OF LIVE KNOT ON	
	WIDTH OF WIDE FACES OF CUT SIZES OF TIMBER Max	Narrow Faces and 1/4 of the Width of Wide Face Close to Edges of Cut Sizes of Timber		Narrow Faces and 1/4 of the Width of Wide Face Close to Edges of Cut Sizes of Timber		Narrow Faces and 1/4 of the Width of Wide Face Close to Edges of Cut Sizes of Timber	
		The Remaining Central Half of the Width of the Wide Faces		The Remaining Central Half of the Width of the Wide Faces		The Remaining Central Half of the Width of the Wide Faces	
	mm	mm	mm	mm	mm	mm	mm
	75	10	10	19	19	29	30
	100	13	13	25	25	38	39
	150	19	19	38	38	57	57
	200	22	25	44	50	66	75
	250	25	29	50	57	75	87
	300	27	38	54	75	81	114
	350	29	41	57	81	87	123
	400	32	44	63	87	96	132
	450	33	47	66	93	99	141
	500	35	50	69	100	105	150
	550	36	52	72	103	108	156
	600	38	53	75	106	114	159
v)	Checks and Shakes	PERMISSIBLE DEPTH		PERMISSIBLE DEPTH		PERMISSIBLE DEPTH	
	WIDTH OF THE FACE OF THE TIMBER Max	Max		Max		Max	
	mm	mm		mm		mm	
	75	12		25		36	
	100	18		35		54	
	150	25		50		75	
	200	33		65		99	
	250	40		81		120	
	300	50		100		150	
	350	57		115		171	
	400	66		131		198	
	450	75		150		225	
	500	83		165		249	
	550	90		181		270	
	600	100		200		300	

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**TABLE 3 PERMISSIBLE DEFECTS FOR CONVERTED TIMBER FOR
NON-STRUCTURAL USE**

(Clause 5.3.2)

Sl. No.	DEFECTS	GRADE 1	GRADE 2
i)	Slope of grain	1 in 15	1 in 12
ii)	a) Live knots:		
	1) Size, <i>Max</i>	13 mm	25
	2) Number per metre	1	2
	b) Decayed knots, dead knots, and knot holes	Not permitted	Permitted provided these shall be completely bored or cut out and tightly plugged with a cross-grained seasoned timber being of the same species of timber and properly glued, so that its grain run in the direction of the main piece
iii)	Checks, depth, <i>Max</i>	3 mm	One-fourth of the total thickness of piece or 6 mm whichever is less
iv)	End split (largest at end and added together)	3 percent of length	5 percent of length
v)	Pitch pockets	—	Permitted except on the exposed edges, provided they are clear and filled up with the putty or filler. When these are located on the exposed edges of the core, they shall be cut out and fitted and glued in with plug of similar species of timber with grains running in the same direction as that of the pieces
vi)	Bow	2 mm per 300 mm	4 mm per 300 mm
vii)	Warp	Deviation of 1 percent	Deviation of 2 percent
viii)	Spring	1 mm per 3 m	2 mm per 2 m
ix)	Cracks	1 mm up to 5 cm thickness	2 mm up to 5 cm thickness
		2 mm for 5-10 cm thickness	3 mm for 5-10 cm thickness
		4 mm for more than 10 cm thickness	6 mm for more than 10 cm thickness
x)	Twist	4 mm per 3 m of length	6 mm per 3 m of length
xi)	Centre heart	Permitted in pieces over 250 sq cm of cross section provided it is sound and well boxed	Permitted
xii)	Cup	4 mm per 3 m of length	8 mm per 3 m of length
xiii)	Wane	Not more than 4 percent on the surface on which it appears	Not more than 8 percent on the surface on which it appears

6. MARKING

6.1 Each cut size of timber shall be marked with the size, end use, and manufacturer's name or trade-mark, if any, at one end.

6.1.1 Each cut size of timber may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act, and the Rules and Regulations made thereunder. Presence of this mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard, under a well-defined system of inspection, testing and quality control during production. This system, which is devised and supervised by ISI and operated by the producer, has the further safeguard that the products as actually marketed are continuously checked by ISI for conformity to the standard. Details of conditions, under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

APPENDIX A

(*Clause 3.2.1*)

METHOD FOR ADJUSTMENT OF DIMENSIONS AT DIFFERENT MOISTURE CONTENT

A-1. All the dimensions given under various clauses shall be taken as standard at 20 percent moisture content.

A-2. For dimensions along the grain no allowances shall be made for moisture contents differing from 20 percent moisture content.

A-3. For cross-sectional dimensions, the allowances given in **A-3.1** to **A-3.4** shall be made irrespective of radial or tangential directions.

A-3.1 For timbers of specific gravity below 0.6 (or dimensional stability 60 percent of teak and above), the change in the dimensions shall be calculated on the basis of 0.2 percent per unit moisture content differing from standard 20 percent moisture content.

A-3.2 For species of specific gravity 0.6 and above (or dimensional stability below 60 percent of teak) the change in the dimensions shall be calculated on the basis of 0.3 percent per unit moisture content differing from standard 20 percent moisture content.

A-3.3 Where greater accuracy is required in individual species the exact figures of change in percent, per unit moisture content (even separately for radial and tangential directions, if so required) may be calculated from the following formula:

$$\frac{1}{K} = \frac{f-p}{s_p} - \frac{f-20}{100}$$

where

K = the required change in percent per unit moisture content corresponding to the approximate value of 0.2 or 0.3 given in A-3.1 and A-3.2; and

f = fibre-saturation-point of the species in question;

p = 12 percent or 0 percent as the case may be corresponding to the shrinkage value taken (average of both may be taken, if necessary);

s_p = standard shrinkage value from green to dry ($p = 12$) or oven-dry ($p = 0$) as calculated by method given in IS : 1708-1969*.

NOTE — The values of f and s_p may be obtained from the various publications of the Forest Research Institute and Colleges, Dehra Dun.

A-3.4 Obtaining the value of K by the methods given in A-3.1, A-3.2 or A-3.3, the dimensions required at moisture content may be calculated using the following formula:

$$d_m = d_{20} \left[1 - \frac{K(20-m)}{100} \right]$$

where

d_m = dimensions required at the moisture content ' m ',

d_{20} = actual dimensions at the standard moisture content 20 percent, and

m = moisture content at which dimensions are required.

*Methods of testing small clear specimens of timber (*first revision*).

INDIAN STANDARDS

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- 190-1960 Coniferous sawn timber intended for further conversion (*second revision*)
- 1326-1958 Non-coniferous sawn timber for further conversion
- 1329-1958 Aircraft timber intended for further conversion
- 1331-1971 Cut sizes of timber (*second revision*)
- 1629-1960 Rules for grading of cut sizes of timber
- 1898-1961 Timber for use in aircraft construction
- 2178-1962 Timber for use in aircraft propeller construction
- 2179-1962 Timber for lorry bodies
- 2372-1963 Timber for cooling towers
- 2377-1967 Tables for volume of cut sizes of timber (*first revision*)
- 3337-1965 Ballies for general purposes
- 3364-1965 Method of measurement and evaluation of defects in timber
- 3731-1966 Grading rules for teak squares
- 4422-1967 Willow clefts for cricket bats
- 4423-1967 Guide for hand sawing of timber
- 4424-1967 Timber for use in mining work
- 4895-1968 Grading rules for teak logs
- 5246-1968 Coniferous logs
- 5247-1968 Coniferous sawn timber for packing cases, crates, etc
- 5806-1971 Non-coniferous timber in converted form for ammunition boxes
- 5966-1970 Non-coniferous timber in converted form for general purposes

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Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 1

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5 Chowringhee Approach
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