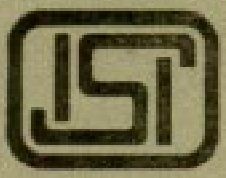
IS : 3308 - 1981
(Reaffirmed 1998)

Indian Standard

SPECIFICATION FOR WOOD WOOL BUILDING SLABS

(First Revision)

UDC 691·115-412



INDIAN STANDARDS INSTITUTION
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SPECIFICATION FOR WOOD WOOL BUILDING SLABS

(First Revision)

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(*Continued on page* 11)

Indian Standard

SPECIFICATION FOR WOOD WOOL BUILDING SLABS

(First Revision)

0. FOREWORD

0.1 This Indian Standard (First Revision) was adopted by the Indian Standards Institution on 30 October 1981, after the draft finalized by the Wood Products Sectional Committee had been approved by the Civil Engineering Division Council.

0.2 Wood wool building slabs consist essentially of wood wool chemically treated and bonded by pressing together with an inorganic cementing filler and adequately matured. Wood wool building slabs are being manufactured in the country and such slabs are in actual use in a number of constructions. This standard lays down the essential requirements of wood wool building slabs for use in constructions and provides the necessary guidance for manufacture of wood wool building slabs in the country.

0.2.1 This standard was first published in 1969 and this is the first revision of the standard. In this revision modifications have been made in the provisions relating to sound absorption, weight stipulation, sizes permissible, etc. Since wood wool slabs of 25 mm thickness only are most commonly used for accoustical purposes, requirements for sound absorption coefficient are included for 25 mm thick slabs only; there being no data available with regard to sound absorption coefficient relevant to other thicknesses (*see* **10.1**).

0.3 In the formulation of this standard, due weightage has been given to international co-ordination among the standards and practices prevailing in different countries in addition to relating it to the practices in the field in this country.

0.4 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 rounding off numerical values (*revised*).

1. SCOPE

1.1 This standard lays down the requirements, such as dimensions, weight and strength for wood wool building slabs.

2. TERMINOLOGY

2.0 For the purpose of this standard, the definitions given in IS : 707-1976* shall apply.

3. TYPES

3.1 The wood-wool building slabs shall be of two types designated as given below:

a) *Type* 1 *Light Weight Slabs* — These slabs are intended primarily for non-load bearing partitions, ceilings, wall linings, permanent shuttering and roof insulation.

b) *Type* 2 *Heavy Duty Slabs* — These slabs are intended for load bearing situations and for use in roof construction. These are also suitable for purposes indicated in Type 1 slabs.

4. MATERIAL

4.1 General — The slabs shall consist essentially of wood wool and an inorganic cementing material mechanically pressed together and adequately matured.

4.2 Timber — Almost any species of timber which satisfies the requirement of density and quality of wood wool slabs may be used for magnesium-oxy-chloride cement bonded wood wool slabs.

4.2.1 For manufacturing Portland cement slab, Fir (Abies spp. other than Abies densa) shall be used. Other species with the addition of suitable additives may be used provided the requirements are met with.

5. FORM AND TEXTURE

5.1 The slabs shall be of uniform thickness with rectangular parallel faces and shall have clean reasonably square edges and shall be of uniform texture. The deviation from rectangular shape shall be not more than 5 mm measured along the edge of the slab.

*Glossary of terms applicable to timber technology and utilization (*second revision*).

6. DIMENSIONS AND TOLERANCES

6.1 The dimensions of the slab shall be as specified in Table 1 unless otherwise agreed to between the purchaser and the manufacturer. The thickness shall be measured in accordance with the procedure given in Appendix A and shall be within the tolerance given in **6.2**.

TABLE 1 DIMENSIONS AND WEIGHT OF SLAB

LENGTH mm	WIDTH mm	TYPE	THICKNESS mm	WEIGHT OF THE SLAB, *Max* kg
2 000	500	1	12	5
			20	8
			25	11
			40	12·5
			50	16
			75	22
			100	27·5
2 000	500	2	40	25·0
			50	30·0
			75	40·0
1 220	610	1	12	3·5
			20	6
			25	8
			40	9·5
			50	12
			75	16
			100	20
1 220	610	2	40	18·5
			50	22
			75	30

6.2 Tolerances — The permissible tolerances shall be ± 6 mm in length, ± 4 mm in width and ±2 mm in thickness.

7. WEIGHT

7.1 The weight of each of the slabs shall not be greater than the values shown in Table 1 for the appropriate thickness.

8. DEFLECTION

8.1 When tested for deflection in accordance with the method given in Appendix B with loads shown in Table 2, the deflection of slabs of different thicknesses shall not exceed the values specified in Table 2.

9. THERMAL CONDUCTIVITY

9.1 The thermal conductivity of test specimens of the wood wool building slabs tested according to guarded hot plate method prescribed in IS : 3346-1966* and maintaining the temperature of the hot plate and cold plate respectively at 30°C and 25°C shall be not more than 0·08 W/m.k.

TABLE 2 DEFLECTION UNDER TEST LOAD

(*Clauses* 8.1 *and* B-3.1)

TYPE	SIZE mm × mm	THICKNESS mm	TEST LOAD kg	TEST SPAN cm	DEFLECTION (*Max*)
1	2 000 × 500	25	100	45	6
	1 220 × 610	25	165	27·5	6
	2 000 × 500	40	90	75	6
	1 220 × 610	50	90	75	6
		75	120	75	5
		100	150	75	5
2	2 000 × 500	40	120	75	6
	1 220 × 610	50	160	75	6
		75	240	75	5

10. SOUND ABSORPTION

10.1 The sound absorption coefficient as determined by the reverberation chamber method, as per IS : 8225-1976† shall be as follows:

Frequency Hertz	*Minimum Sound Absorption Coefficient for 25 mm Thickness with Rigid Backing*
125	0·1
250	0·2
500	0·2
1 000	0·3
2 000	0·5
4 000	0·5

10.1.1 Sound absorption coefficient for other thicknesses shall be subject to the agreement between the supplier and the purchaser.

*Method for the determination of thermal conductivity of thermal insulation materials (two slab, guarded hot-plate method).

†Method of measurement of absorption coefficient in a reverberation room.

11. SAMPLING AND CRITERIA FOR CONFORMITY

11.1 Lot — All the slabs of the same thickness manufactured by the same manufacturer with similar raw materials shall constitute a lot.

11.2 Each lot shall be considered separately for determining its conformity to the requirements of this specification. For this purpose a number of samples shall be taken at random from the lot.

11.2.1 For ensuring the randomness of selection of the samples from the lot, the procedures given in IS : 4905-1968* are recommended.

11.2.2 The number of samples to be selected at random from the lot shall be in accordance with columns 1 and 2 of Table 3.

TABLE 3 NUMBER OF SAMPLE SLABS TO BE SELECTED FROM THE LOT

Lot Size	No. of Slabs in the Sample	Acceptance Number	No. of Slabs in Sub-sample
(1)	(2)	(3)	(4)
Up to 100	5	0	2
101 to 300	8	0	2
301 to 500	13	0	3
501 and above	20	1	5

11.3 The samples selected from the lot in accordance with columns 1 and 2 of Table 3 and in **11.2.2** shall be inspected for visual dimensional and weight requirements.

11.3.1 The lot shall be considered to be conforming to these requirements if the number of samples failing to meet any one or more of these requirements does not exceed the acceptance number given in column 3 of Table 3.

11.4 From among the samples which have been found satisfactory in respect of visual, dimensional and weight requirements in **11.3**, a sub-sample of size given in column 4 of Table 3 shall be taken at random. The slabs in the sub-sample shall be tested for the remaining requirements such as deflection, thermal conductivity and sound absorption.

11.4.1 The lot shall be considered to conform to these requirements if none of the samples in the sub-sample fails in respect of any of these requirements.

*Methods for random sampling.

12. MARKING

12.1 Each wood wool slab shall be legibly and indelibly marked with the following:

a) Name of manufacturer or trade-mark, if any;

b) Date of manufacture; and

c) Thickness of slab.

12.1.1 Each slab 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. The ISI 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 which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. 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* 6.1)

METHODS OF MEASURING THICKNESS OF SLABS

A-1. PROCEDURE

A-1.1 Make the measurements at the points of apparent maximum and minimum thickness of the slabs at a distance of not less than 10 cm from the edge.

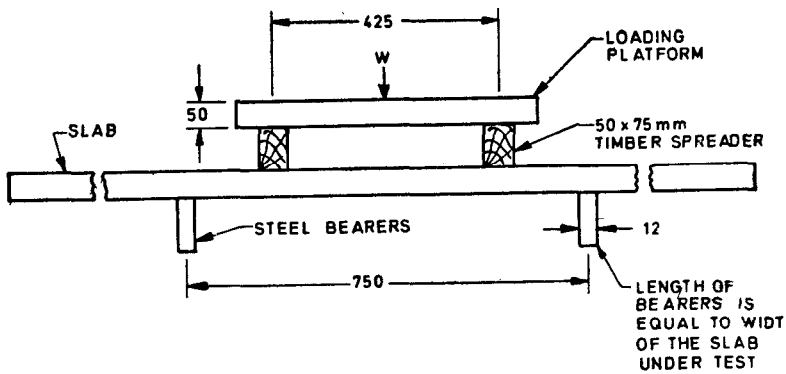
A-1.2 Place 5 cm × 5 cm × 10 mm thick steel plates on the top and bottom surfaces of the slabs at the point to be measured and measure the thickness by means of calipers placed over the centre of the steel plates, that is, the thickness measured is that of the slab plus that of the two steel plates. Obtain the thickness of the slab by subtracting the measured total thickness of the steel plates from the measured thickness of slab and plates.

APPENDIX B
(*Clause* 8.1)

LOADING AND DEFLECTION TEST

B-1. PROCEDURE

B-1.1 The test rigs are shown in Fig. 1 and 2. The length of the spreaders and bearers is at least equal to the width of the slab being tested, and the supporting surfaces of the bearers are 12 mm wide, levelled flat and parallel with each other. The spreaders are parallel with and symmetrically placed between the bearers.



All dimensions in millimetres.

FIG. 1 TEST RIG FOR LOADING AND DEFLECTION TEST ON 40, 50, 75 AND 100 mm

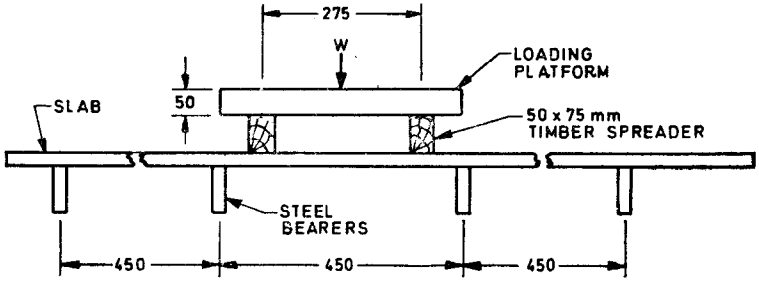
B-2. PLACING OF SLABS

B-2.1 When testing 40, 50, 75 and 100 mm slabs, test each slab three times on 75 cm spans (*see* Fig. 1), with the same face uppermost as follows:

a) With the bearers placed symmetrically about the centre of the slab;

b) With the left hand bearer 7·5 cm from the left hand end of the slab; and

c) With the right hand bearer 7·5 cm from the right hand end of the slab.



NOTE— When 1 220 mm length slabs are tested on steel bearers separated by 27·5 cm, the distance between spreaders shall be 168 mm (*see* Table 2 for weight and deflection).

All dimensions in millimetres.

FIG. 2 TEST RIG FOR LOADING AND DEFLECTION TEST ON 25 mm SLABS AND FOR LENGTH 2 000 mm

B-2.2 When testing 25 mm slabs, test each slab by laying it on four bearers (*see* Fig. 2), giving three 45 cm spans for 2 000 mm length of slabs and 27·5 cm span for 1 220 mm length of slabs and apply the load in the centre of each span in succession without moving the slab.

B-3. LOADING

B-3.1 Apply the load *W* to the loading platform starting at zero and increasing steadily and uniformly at a rate not exceeding 110 kg/min up to the test load specified in Table 2. Maintain the test load for at least one minute and then measure the maximum deflection to the nearest 0·5 mm by means of a deflectometer located on a 5 cm diameter plane metal plate, 3 mm thick on the surface of the slab. Record the deflections separately for each test.

(*Continued from page* 2)

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1658-1977 Fibre hardboards (*second revision*)

1659-1979 Block boards (*second revision*)

2380 (Parts I to XXI)-1977 Methods of test for wood particle boards and boards from other lignocellulosic materials (*first revision*)

3087-1965 Wood particle boards (medium density) for general purposes

3097-1980 Veneered particle boards (*first revision*)

3129-1965 Particle board for insulation purposes

3308-1981 Wood wool building slabs (*first revision*)

3348-1965 Fibre insulation boards

3478-1966 High density wood particle boards

INTERNATIONAL SYSTEM OF UNITS (SI UNITS)

Base Units

Quantity	*Unit*	*Symbol*
Length	metre	m
Mass	kilogram	kg
Time	second	s
Electric current	ampere	A
Thermodynamic temperature	kelvin	K
Luminous intensity	candela	cd
Amount of substance	mole	mol

Supplementary Units

Quantity	*Unit*	*Symbol*
Plane angle	radian	rad
Solid angle	steradian	sr

Derived Units

Quantity	*Unit*	*Symbol*	*Definition*
Force	newton	N	1 N = 1 kg.m/s^2
Energy	joule	J	1 J = 1 N.m
Power	watt	W	1 W = 1 J/s
Flux	weber	Wb	1 Wb = 1 V.s
Flux density	tesla	T	1 T = 1 Wb/m^2
Frequency	hertz	Hz	1 Hz = 1 c/s (s^{-1})
Electric conductance	siemens	S	1 S = 1 A/V
Electromotive force	volt	V	1 V = 1 W/A
Pressure, stress	pascal	Pa	1 Pa = 1 N/m^2

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AMENDMENT NO. 1 JULY 2000
TO
IS 3308 : 1981 SPECIFICATION FOR WOOD WOOL BUILDING SLABS

(First Revision)

(*Page* 3, *clause* **0.3**) — Insert the following clause after **0.2.1** and renumber the subsequent clauses:

'**0.3** A scheme of labelling environment friendly products to be known as ECO Mark has been introduced at the instance of the Ministry of Environment and Forests (MEF), Government of India. The ECO Mark shall be administered by the Bureau of Indian Standards (BIS) under the BIS Act, 1986 as per the Resolution No. 71 dated 21 February 1991 and Resolution No. 425 dated 28 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 of the 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 logo. Requirements to be satisfied for a product to qualify for the BIS Standard Mark for Eco friendliness, will be included in the relevant published Indian Standards through an amendment. These requirements will be optional; manufacturing units will be free to opt for ISI Mark alone also.

The amendment pertaining to Eco criteria is based on the Gazette Notification No. 170 dated 18 May 1996 for Wood Substitutes as Environment Friendly Products published in the Gazette of the Government of India India.'

(*Page* 4, *clause* **4.2**) — Insert the following matter at the end of the clause:

'For ECO Mark, only species of wood from sources other than natural forests such as wood from rubber, coconut, cashew, industrial and social forestry plantations etc and shade trees from tea and coffee estates, wood residues shall be used for the manufacture of wood wool building slabs.'

(*Page* 6, *clause* **9.1**) — Substitute 'IS 3346 : 1980' *for* 'IS : 3346 : 966'.

(*Page* 6, *clause* **10.1**) — Substitute 'IS 8225 : 1987' *for* 'IS : 8225 - 1976'.

(*Page* 6, *footnotes marked with* '*' *and* '†' *marks*) — Substitute the following for the existing footnotes:

'*Method for the determination of thermal conductivity of thermal insulation materials (two slab guarded hot-plate method) (*first revision*).

†Measurement of sound absorption in a reverberation room (*first revision*).'

(*Page* 7, *clause* **11.4.1**) — Insert the following new clauses after **11.4.1** and renumber the subsequent clauses:

'**12 OPTIONAL REQUIREMENTS FOR ECO MARK**

12.1 General Requirements

12.1.1 Wood wool building slabs shall conform to the requirements of quality and performance as specified in this standard.

12.1.2 The manufacturer shall produce to BIS environmental consent clearance from the concerned 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 of 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 Requirements

The wood wool building slabs shall conform to the specific requirements given for ECO Mark under relevant clause of the standard.

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

(*Page* 8, *renumbered clause* **13.1**) — Insert the following matter under the clause:

'd) The criteria for which the particle board has been labelled as ECO Mark.'

(CED 20)

Reprography Unit, BIS, New Delhi, India