

इंटरनेट

मानक

Disclosure to Promote the Right To Information

Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

“जानने का अधिकार, जीने का अधिकार”

Mazdoor Kisan Shakti Sangathan

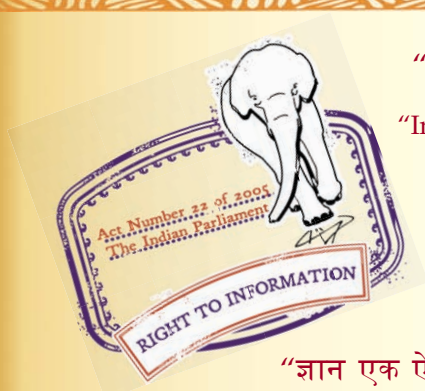
“The Right to Information, The Right to Live”

“पुराने को छोड़ नये के तरफ”

Jawaharlal Nehru

“Step Out From the Old to the New”

IS 653 (1992): Linoleum Sheets And Tiles [CED 5: Flooring, Wall Finishing and Roofing]



“ज्ञान से एक नये भारत का निर्माण”

Satyanarayan Gangaram Pitroda

“Invent a New India Using Knowledge”



“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

BLANK PAGE



भारतीय मानक

लिनोलियम चद्दरें तथा टाइलें - विशिष्ट

(तीसरा पुनरीक्षण)

Indian Standard

LINOLEUM SHEETS AND TILES -
SPECIFICATION

(*Third Revision*)

First Reprint JULY 2000

UDC 69.025.355.2/.4

© BIS 1992

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

June 1992

**AMENDMENT NO. 1 JULY 2003
TO
IS 653 : 1992 LINOLEUM SHEETS AND TILES —
SPECIFICATION**

(Third Revision)

(Page 1, clause 3.2) — Substitute the following for the existing clause:

'3.2 The type of hessian used for backing is dependent on the type of linoleum, method of manufacture and the machine used for manufacture. It is mandatory on the part of the manufacturer to select correct type of hessian so as to produce linoleum which conform to the requirements stipulated in the present standards.'

(Page 1, clauses 3.3 and 3.3.1) — Delete.

(Page 1, clause 4.2) — Substitute the following for the existing clause:

'4.2 Linoleum other than plain, shall be designated as in laid linoleum. They are composed of different colours extending from the wearing surface to the backing at random to form a variegated surface.'

(Page 1, clause 5.1.1, line 3) — Substitute '5.0' for '5.5'.

(Page 1, clause 5.2) — Substitute the following for the existing:

'5.2 Thickness

The standard overall thickness of linoleum sheet and tiles shall be 4.5 mm, 3.2 mm, 2.5 mm and 2.0 mm.'

(Page 1, clause 6.2) — Delete.

[Page 3, Table 1, Sl No. (viii)] — Substitute the following for the existing:

viii)	Water absorption	For Thickness	Water Absorption,
		mm	Percent, Max
		4.5	5.5
		3.2	6.5
		2.5	9.0
		2.0	10.0

[Page 3, Table 1, Sl No. (ix)] — Delete.

Amend No. 1 to IS 653 : 1992

[*Page 3, Table 1, Sl No. (x)*]—Substitute 'ix' for 'x' and '8' for '9'.

(*Page 4, List of Referred Indian Standards*) —Delete IS 2818 (Part 2):1991 and its title.

(CED 5)

FOREWORD

This Indian Standard (Third Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Flooring, Wall Finishing and Roofing Sectional Committee had been approved by the Civil Engineering Division Council.

Linoleums are normally used for covering floors of railway coaches, ships, road transport vehicles, hospitals, canteens, office and industrial buildings. They are also suitable for use in special locations like laboratories.

This standard was first published in 1955 and subsequently revised in 1962 and 1980. In the present revision requirement for colour fastness to day light has been given in place of colour fastness to artificial light. The sizes of tiles and sheets have also been modified.

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 'Rules for rounding off numerical values (revised)'. 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

LINOLEUM SHEETS AND TILES — SPECIFICATION

(Third Revision)

1 SCOPE

This standard specifies the requirements of linoleum manufactured as sheets or tiles on a hessian backing and used as floor covering.

NOTE — This standard does not include jute canvas as backing material.

2 REFERENCES

The Indian Standards listed in Annex A are necessary adjuncts to this standard.

3 MATERIALS

3.1 The wearing surface of the linoleum shall be made from the following material:

- a) Oxidized or polymerized linseed oil (conforming to IS 75 : 1973) or other suitable drying oil, with necessary driers;
- b) Rosin or resin or their combination;
- c) Cork flour or wood flour or both;
- d) Mineral fillers; and
- e) Colouring material or pigments.

NOTE — The material shall be mixed and pressed to a specially smooth surface on the backing (see 3.2). The backing material shall be securely bonded to the wearing surface.

3.2 The minimum requirement of hessian used for backing shall conform to Type II of IS 2818 (Part 2) : 1971.

3.3 The paint, if used, for painting the hessian backing shall conform to the requirement given below:

Sl No.	Characteristic	Requirement
i)	Red oxide	7 percent
ii)	Whiting	77 percent
iii)	Linseed oil	14 percent
iv)	White spirit	5 percent

3.3.1 The permissible variation on the requirement given in 3.3 shall be $\pm 1^0$ percent.

4 TYPES

4.1 Plain Linoleum

The composition of plain linoleum shall be of uniform colour extending evenly throughout the

full thickness from the wearing surface to the hessian backing.

4.2 Moire, Jaspe and Marble Linoleum

The composition of moire, jaspe and marble linoleum shall be of different colours. The colours shall extend from the wearing surface to the backing at random to form a variegated surface.

5 DIMENSIONS AND TOLERANCES

5.1 Linear Dimensions

5.1.1 Sheets

Unless otherwise specified the linoleum sheets of all thickness shall be supplied in rolls of lengths not less than 5.5 m. The standard width of the sheets shall be 2.0 m.

5.1.2 Tiles

The size of tiles shall be 225, 300 and 450 mm square.

NOTE — Other sizes as agreed to between the manufacturer and the purchaser may be used.

5.2 Thickness

The standard overall thickness of the linoleum tiles be 4.5 mm, 3.2 mm, 2.0 mm and 1.65 mm.

5.3 Tolerances

The tolerances on the specified width of sheets, tile sizes and thickness shall be as given in Table 1.

5.4 Cork Tiles

Cork tiles if supplied shall be of sizes and thickness as specified in 5.1.2 and 5.2 respectively. The permissible deviation in thickness shall be ± 5 percent.

6 FINISH

6.1 The wearing surface of linoleum shall be smooth, uniform and shall be free from indentations, cracks and protruding particles.

6.2 The hessian backing shall not be painted unless otherwise specified.

7 PHYSICAL REQUIREMENT

The linoleum sheets

the requirements given in col 3 of Table 1 when tested in accordance with the provisions given in col 4 of Table 1.

8 PACKING

8.1 The linoleum sheet shall be tightly wound on cores of mandrels of diameter not less than 75 mm. The rolls shall be wrapped in kraft paper (the weight of which shall not be less than 50 g/m²) securely tied or otherwise fastened and finally packed in strong hessian or sacking. The ends of the rolls shall be suitably protected by means of cardboard or other suitable disc to avoid any damage.

8.2 The linoleum tiles shall be packed in cardboard boxes.

9 MARKING

9.1 Sheets

Each roll of linoleum sheets shall be suitably marked either on the back or by means of adhesive label with the following:

- a) Indication of the sources of manufacture,
- b) Length of roll and thickness,
- c) Type, and
- d) Manufacturer's batch number.

9.2 Tiles

Each box shall suitably be marked with the following:

- a) Indication of the source of manufacture,
- b) Size and thickness,
- c) Type, and
- d) Manufacturer's batch number.

9.3 The sheets and tiles may also be marked with the Standard Mark.

10 SAMPLING AND CRITERION FOR CONFORMITY

10.1 Sheet

10.1.1 Lot

All the rolls of sheet linoleums of the same type, thickness and manufactured from same batch shall be grouped together to constitute a lot.

10.1.2 Selection

The number of rolls to be selected at random from the lot for determining the conformity of the lot to this specification shall depend upon the size of the lot and shall be in accordance with col 1 and 2 of Table 2.

10.1.3 The sample rolls shall be selected at random from the lot and in order to ensure the randomness of selection, random number tables (see IS 4905 : 1968) may be used. In case random number tables are not available, the

following procedure may be adopted for the selection of the rolls:

Starting from any roll in the lot, count them as 1, 2, 3, r , and so on in one order. Every r th roll thus counted may be selected till the requisite number of rolls for the sample is obtained, r being the integral part of N/n , where N is the number of rolls in the lot and n is the number of rolls to be selected in the sample.

10.1.4 Criteria for Conformity

The number of rolls/sheets selected in accordance with 10.1.2 and 10.1.3 shall be tested for all the requirements of this specification. A roll/sheet failing in respect of one or more of the requirements shall be called a defective roll/sheet. If the number of defective rolls/sheets in the sample is less than or equal to the corresponding permissible number given in col 3 of Table 2, the lot shall be considered as conforming to the requirements of this specification. If the number of defective rolls/sheets is more than the corresponding permissible number, the roll/sheet shall be considered as not conforming to the requirements of this specification.

10.2 Tiles

10.2.1 Lot

All the tiles of the same type, size and manufactured from the same batch in one consignment shall constitute a lot.

10.2.2 Sample Size

The number of tiles to be selected at random from the lot shall depend on the size of the lot and shall be in accordance with col 1 to 4 of Table 3.

10.2.3 The tiles shall be selected at random from the lot, and in order to ensure the randomness of selection, random number tables may be used (see IS 4905 : 1968). In case, random number tables are not available, the following procedure may be adopted for the selection of tiles:

Starting from any roll in the lot, count them as 1, 2, 3... ..., r , and so on in one order. Every r th rolls thus counted may be selected till the requisite number of rolls for the sample is obtained, r being the integral part of N/n , where N is the number of rolls in the lot and n is the number of rolls to be selected in the sample.

10.3 Criteria for Conformity

The number of tiles in the first sample (see col 2 and 3 of Table 3), shall first be tested for all the requirements of this specification. If in the first sample the number of defective tiles, that

Table 1 Requirement of Linoleum Sheets, Linoleum Tiles and Cork Tiles
(*Clauses 5.3 and 7*)

Sl No.	Characteristic	Requirement	Method of Test (Ref to Relevant Clauses of IS 9704 : 1980)
(1)	(2)	(3)	(4)
i)	Width of sheet	Average value shall not vary by more than ± 3 mm	2
ii)	Tolerance to tile size (<i>see Note</i>)	± 0.15 percent	2
iii)	Thickness	Average value shall not vary by more than ± 0.15 mm	2
iv)	Squareness (for tiles only)	Gap between the sides of the tile and arms of the metal jig, shall not be greater than 0.25 mm at any point along the sides	3
v)	Seasoning (for plain linoleum only)	The cut surface shall show no difference in colour or grain, between the edges and the centre, 24 hours after the cut has been made	4
vi)	Residual indentation	Shall not exceed 10 percent of the original overall thickness	5
vii)	Flexibility	Shall not crack or break	6
viii)	Water absorption	<div>For Thickness Water Absorption,</div> <div>mm Percent, Max</div> <div>4.5 5.5</div> <div>3.2 6.5</div> <div>2.0 10.0</div> <div>1.65 11.5</div>	7
ix)	Ageing	After ageing, the sheets shall show no sign of dis-colouration, shall also satisfy the requirements of residual indentation, flexibility, colour fastness, water absorption after ageing.	9
x)	Colour fastness to day light	Shall not be inferior to that of No. 5 of the standard patterns of the blue dyed wool cloth as specified in IS 686 : 1985	9

NOTE — The tolerances on sizes are applicable at the time of actual cutting of the tiles.

Table 2 Sample Size and Criterion for Conformity for Sheets
(*Clause 10.1.2*)

No. of Rolls in the Lot	No. of Rolls to be Selected in the Sample	Permissible No. of Defective Rolls
(1)	(2)	(3)
Up to 50	3	0
51 to 150	5	0
151 to 300	8	0
301 to 500	13	0
501 to 1 000	20	0
1 001 and above	32	1

Table 3 Sample Size and Criterion for Conformity
(*Clauses 10.2 and 10.3*)

No. of Tiles in the Lot	Sample	Sample Size	Cumulative Sample Size	Acceptance Number <i>a</i>	Rejection Number <i>r</i>
(1)	(2)	(3)	(4)	(5)	(6)
Up to 300	First	13	13	0	2
	Second	13	26	1	2
301 to 500	First	20	20	0	2
	Second	20	40	1	2
501 to 1 000	First	32	32	0	2
	Second	32	64	3	4
1 001 to 3 000	First	50	50	1	4
	Second	50	100	4	5
3 001 and above	First	80	80	2	5
	Second	80	160	6	7

is, those failing to satisfy any one or more of the requirements is less than or equal to the corresponding acceptance number *a* (*see* col 5 of Table 3), the lot shall be considered as conforming to the requirements of this standard. If the number of defective tiles in the first sample is more than or equal to the corresponding rejection number *r* (*see* col 6 of Table 3), the lot shall be considered as not conforming. If the number of defective tiles in the first sample lies between the corresponding values of *a* and *r*, a

second sample (*see* col 2 and 3 of Table 3), shall be selected and tested for all the requirements (*see* SI No. IX of Table 1). If in the combined sample, the number of defective tiles are less than or equal to corresponding acceptance number *a*, the lot shall be considered as conforming, and if the number of defective tiles are more than or equal to the corresponding rejection number *r*, the lot shall be considered as not conforming.

LIST OF REFERRED INDIAN STANDARDS

<i>IS No.</i>	<i>Title</i>	<i>IS No.</i>	<i>Title</i>
75 : 1973	Specification for linseed oil, raw and refined (<i>second revision</i>)	2818 (Part 2) : 1991	Specification for Indian hessian : Part 2 305 and 229 g/m ² at 16 percent contact regain (<i>first revision</i>)
686 : 1985	Methods of determination of colour fastness of textile material to day light (<i>first revision</i>)	4905 : 1968	Methods of random sampling
		9704 : 1980	Methods of test for linoleum sheets and tiles

Bureau of Indian Standards

BIS is a statutory institution established under the *Bureau of Indian Standards Act, 1986* to promote harmonious development of the activities of standardization, marking and quality certification of goods and attending to connected matters in the country.

Copyright

BIS has the copyright of all its publications. No part of these publications may be reproduced in any form without the prior permission in writing of BIS. This does not preclude the free use, in the course of implementing the standard, of necessary details, such as symbols and sizes, type or grade designations. Enquiries relating to copyright be addressed to the Director (Publication), BIS.

Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Handbook' and 'Standards Monthly Additions'.

This Indian Standard has been developed from Doc: No. **CED 5 (4542)**

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

BUREAU OF INDIAN STANDARDS

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002
Telephones: 323 01 31, 323 33 75, 323 94 02

Telegrams: Manaksanstha
(Common to all offices)

Regional Offices:

	Telephone
Central : Manak Bhavan, 9 Bahadur Shah Zafar Marg NEW DELHI 110002	323 76 17, 323 38 41
Eastern : 1/14 C.I.T. Scheme VII M, V.I.P. Road, Maniktola CALCUTTA 700054	{ 337 84 99, 337 85 61 337 86 26, 337 91 20
Northern : SCO 335-336, Sector 34-A, CHANDIGARH 160022	{ 60 38 43 60 20 25
Southern : C.I.T. Campus, IV Cross Road, CHENNAI 600113	{ 235 02 16, 235 04 42 235 15 19, 235 23 15
Western : Manakalaya, E9 MIDC, Marol, Andheri (East) MUMBAI 400093	{ 832 92 95, 832 78 58 832 78 91, 832 78 92
Branches : AHMADABAD. BANGALORE. BHOPAL. BHUBANESHWAR. COIMBATORE. FARIDABAD. GHAZIABAD. GUWAHATI. HYDERABAD. JAIPUR. KANPUR. LUCKNOW. NAGPUR. PATNA. PUNE. THIRUVANANTHAPURAM.	