IS 3461 (1980): PVC-asbestos floor tiles [CED 5: Flooring, Wall Finishing and Roofing]

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Indian Standard

SPECIFICATION FOR PVC ASBESTOS FLOOR TILES

(First Revision)

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

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Indian Standard

SPECIFICATION FOR PVC ASBESTOS FLOOR TILES

(First Revision)

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AMENDMENT NO. 1 OCTOBER 1983

TO

IS:3461-1980 SPECIFICATION FOR PVC ASBESTOS FLOOR TILES

(First Revision)

Alteration

[*Page 7, Table 1, Sl No.*(x), *col 3*] - Substitute the following for the existing matter:

'Grade A type shall not suffer a fracture and Grade B type shall not break but may contain a crack extending within a circle of 40 mm radius around the point of impact.'

Addenda

(*Page 5, clause 3.2*) - Add the following new clause after 3.2:

'3.3 The tiles shall be of two grades [*see* Sl No. (x) of Table I]'

(BDC 5)

Reprography Unit, BIS, New Delhi, India

AMENDMENT NO. 2 JUNE 1990
TO
IS 3461:1980 SPECIFICATION FOR
PVC ASBESTOS FLOOR TILES

(First Revision)

(Pages 6 and 7, Table 1) - Substitute 'IS : 3464-1986' for 'IS : 3464- 1980'.

(Page 6, Table 1) - Substitute 'IS 686-1985' for 'IS : 686-1957'.

(Page 7, Table 1, footnotes) - Substitute the following for the existing footnotes:

'*Methods of test for plastic floor covering and wall tiles (second revision).

+Method for determination of colour fastness of textile materials to daylight (first revision).'

(CED 5)

Reprography Unit, BIS, New Delhi, India

AMENDMENT NO. 3 NOVEMBER 1992
TO
IS 3461 : 1980 SPECIFICATION FOR PVC ASBESTOS FLOOR TILES

(First Revision)

(*Cover page, pages* 1 *and* 3) — Substitute the following for the existing title:

'*Indian Standard*

SPECIFICATION FOR PVC FLOOR TILES (WITH OR WITHOUT ASBESTOS)

(First Revision)

(*Page* 3, *clause* 0.2.1, *lines* 5 *and* 6) — Substitute the words 'Rigid PVC floor covering tiles are' *for* 'Asbestos PVC flooring tiles are rigid,'.

(*Page* 4, *clause* 1.1, *line* 2) —Substitute 'PVC floor tiles (with or without asbestos)' *for* 'PVC asbestos floor tiles'.

(*Page* 4, *clause* 2.1, *line* 2) — Delete the words 'asbestos fibre,'.

(*Page* 5, *clause* 2.1.1, *Note*) — Delete.

(*Pages* 6 *and* 7, *Table* 1) — Substitute the following for the existing caption:

'TABLE 1 REQUIREMENTS FOR PVC FLOOR TILES (WITH OR WITHOUT ASBESTOS)'

(*Page* 7, *Table* 1):

a) *Sl No.* (ix), *col* 4 — Substitute '13' *for* '12'.

b) *Sl No.* (x), *col* 4 — Substitute '14' *for* '13'.

c) *Note, line* 2 — SubstituteCor tiles' *for* 'PVC asbestos floor tiles'.

(CED 5)

Reprography Unit, BIS, New Delhi, India

AMENDMENT NO. 4 MAY 2002
TO
IS 3461 : 1980 SPECIFICATION FOR PVC ASBESTOS FLOOR TILES

(First Revision)

(*Page* 5, *clause* 3.1) — Substitute the following for the existing clause:

'3.1 The standard size of the tiles shall be 200, 250 and 300 mm square.'

(*Page* 5, *clause* 3.2) — Substitute 'On 250 and 300 mm' *for* 'On 250 mm'.

(CED 5)

Reprography Unit, BIS, New Delhi, India

Indian Standard

SPECIFICATION FOR PVC ASBESTOS FLOOR TILES

(First Revision)

0. FOREWORD

0.1 This Indian Standard (First Revision) was adopted by the Indian Standards Institution on 24 November 1980, after the draft finalized by the Flooring and Plastering Sectional Committee had been approved by the Civil Engineering Division Council.

0.2 PVC floor coverings have been in use in the country for more than a decade. They provide dust free, noise absorbing, resilient and decorative surface for buildings of various types. The floor coverings are available in different shades and designs.

0.2.1 There are two kinds of PVC flooring. One is flexible which is normally available in sheet form, and the other is rigid which is available in standard tile sizes. Flexible PVC covering is suitable for comparatively lighter traffic. either for rigid floors such as concrete and stone flooring or for flexible floors such as timber flooring. Asbestos PVC flooring tiles are rigid, comparatively more suitable for heavy traffic, and for rigid floors such as concrete and stone flooring. PVC floor coverings are not suitable for areas and surfaces exposed to sunlight and rain.

0.3 This standard was first published in 1966. It is being revised to incorporate improvements found necessary in the light of the usage of the standard and the suggestions made by the various bodies implementing it. Experience shows that the modular size of the tiles which was specified in the earlier version are not being manufactured in the country. But the Sectional Committee responsible for preparation of the standard felt that the difficulties experienced by the manufacturers to produce tiles of modular size could be overcome by adjusting the manufacturing practice gradually and with this aspect in view the dimensionally co-ordinated sizes have been retained But due to large consumer demand, the size of tiles which are actually manufactured and which form the bulk of current production in the country has also been included. It has been seen that PVC tiles shrink due to long and short storage and it is due to the volatile matter present in the composition

of such tiles. A larger tolerance on the size of the tiles has therefore been permitted to take into account the presence of such volatile matter. The water absorption, surface spread of flame, and ageing characteristics of the tiles have been found to be not of much help in controlling their quality and as such they have been removed from the present revision. The word ' Vinyl ' which was used in the title as well as in the text of the earlier version has also been deleted since the word is the trade abbreviation of PVC and does not recommend any property of the tiles in particular. The requirement for deflection and indentation characteristics has also been modified which was felt necessary due to improvements made by the industry. The fire behaviour characteristics of such tiles are being investigated and the requirement would be added in the standard as and when the informations are available.

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

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1. SCOPE

1.1 This standard lays down the requirements for smooth surfaced homogeneous PVC asbestos floor tiles.

NOTE — This standard does not cover laminated floor tiles and floor tiles having an embossed surface.

2. MATERIALS

2.1 The floor tiles shall consist of a thoroughly blended composition of thermoplastic binder, asbestos fibre, fillers and pigments. The thermoplastic binder shall consist substantially of one or both of the following:

a) Vinyl chloride polymer, and

b) Vinyl chloride copolymer.

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

2.1.1 The polymeric material shall be compounded with suitable plasticizers and stabilizers.

NOTE — Chrysotile type of asbestos are preferable for manufacturing PVC asbestos floor tiles.

3. DIMENSIONS AND TOLERANCES

3.1 The standard size of the tiles shall be 200 and 250 mm square.

3.1.1 The thickness of the tiles shall be 1·5, 2·0, 2·5 and 3·00 mm.

NOTE — Tiles of size and shape other than those specified in this standard may be supplied if agreed between the purchaser and the supplier.

3.2 The permissible tolerances on the dimensions specified in **3.1** and **3.1.1** shall be as follows:

Dimensions	*Tolerances* mm
On 200 mm	± 0·4
On 250 mm	± 0·5
On thickness	± 0·15

NOTE — A tolerance on length and width of ± 0·2 percent shall be taken for tiles other than specified in **3.1**.

4. COLOUR AND FINISH

4.1 The tiles shall be plain or mottled. The colour, finish and mottling shall match a sample agreed by the purchaser and the supplier. Plain tiles shall have the colour uniformly distributed throughout the tile. Mottled tiles shall have the colour distributed at random throughout the thickness of the tile.

NOTE — In normal manufacture tiles from different batches may vary somewhat in shade of the colour. A variation in mottling is characteristic of the material.

5. PHYSICAL REQUIREMENTS

5.1 The tiles shall conform to the requirements given in col 3 of Table 1 when tested in accordance with the provisions given in col 4.

6. TESTS

6.1 The tests shall be of three categories as given in **6.1.1** to **6.1.3**.

6.1.1 *Type Tests* — Tests carried out to prove conformity to the requirements of this specification. These tests are intended to check the general qualities and design of the tile.

TABLE 1 REQUIREMENTS OF PVC ASBESTOS FLOOR TILES

(*Clause* 5.1)

Sl No.	Characteristic	Requirement	Method of Test, Ref to Relevant Cl of IS : 3464-1980*
(1)	(2)	(3)	(4)
i)	Squareness	Gap between the sides of the tile and the arms of the metal jig shall not be greater than 0·15 mm for last 50 mm towards the farther end from the junction of the arms	4
ii)	Dimensional stability	Change in any linear dimension shall not exceed 0·25 percent	5
iii)	Colour fastness to daylight	Shall not be inferior to that of No. 5 of the 8 standard patterns of blue dyed woollen fabric specified in IS : 686-1957†	6
iv)	Volatile matter	Loss in weight shall not exceed 1 percent	7
v)	Curling	Shall not exceed 0·75 mm	8
vi)	Indentation		9
	a) At 27 ± 2°C	Average indentation at the end of one minute shall not exceed 0 38 mm and no individual reading shall deviate from the average by more than 0·05 mm. In relation to the one minute indentation figures, the average indentation at the end of 10 minutes shall not exceed the value given in Table 2 and no individual reading shall deviate from the average by more than 0·05 mm	
	b) At 46 ± 2°C	Average indentation shall not exceed 0·82 mm and no individual reading shall deviate from the average by more than 0·05 mm	
vii)	Residual indentation	Shall not exceed 0·15 mm	10

(*Continued*)

TABLE 1 REQUIREMENTS OF PVC ASBESTOS FLOOR TILES — *Contd*

Sl No.	Characteristic	Requirement	Method of Test, Ref to Relevant Cl of IS : 3464-1980*
(1)	(2)	(3)	(4)
viii)	Resistance to various substances (*see* Note)	After immersion in various substances and when tested the width of the scratch on the surface shall not exceed 3 mm. The colour of the treated test piece shall show no significant change when compared with the untreated test piece	11
ix)	Deflection	Shall deflect at least 25 mm without breaking	12
x)	Impact	Shall not suffer a fracture	13
xi)	Abrasion resistance	To be agreed between the purchaser and the supplier	20

Note — This requirement is related to the situation of use and the purchaser shall specify the substances to which PVC asbestos floor tiles shall have resistance when tested by the method given in IS : 3464-1980*.

*Methods of test for plastic floor covering and wall tiles (*first revision*).
†Method for determination of colour fastness of textile materials to daylight.

TABLE 2 INDENTATION LIMITS AT 27 ± 2°C

[*Table* 1, *Item* 6(a)]

Indentation at One Minute	Corresponding Maximum Indentation at Ten Minutes
(1)	(2)
mm	mm
0·18	0·27
0·20	0·31
0·23	0·35
0·25	0·38
0·28	0·41
0·30	0·44
0·33	0·47
0·36	0·50
0·38	0·52

6.1.2 *Acceptance Tests* — Tests carried out on tiles selected from a lot for purposes of acceptance of the lot.

6.1.3 *Routine Tests* — Tests carried out on every tile to check the requirements which are likely to vary during production.

6.2 Categories of Tests

6.2.1 *Type Tests* — The following shall comprise the type tests (*see* **6.1.1**):

a) Colour and finish,
b) Dimensions and tolerances,
c) Squareness,
d) Dimensional stability,
e) Deflection,
f) Impact,
g) Colour fastness to daylight,
h) Volatile matter,
j) Curling,
k) Indentation,
m) Residual indentation, and
n) Resistance to various substances.

6.2.2 *Acceptance Tests* — The following shall comprise the acceptance tests (*see* **6.1.2**). Acceptance tests shall be carried out on samples selected from each lot in accordance with the sampling procedure detailed in Appendix A:

a) Dimensions and tolerances,
b) Squareness,
c) Dimensional stability,
d) Deflection,
e) Impact, and
f) Indentation.

6.2.3 *Routine Tests* — The test on colour and finish shall comprise the routine test (*see* **6.1.3**) and shall be carried out on every tile.

7. PACKING

7.1 The tiles shall be packed in cardboard or corrugated boxes. Each box shall be marked with the following information:

a) Name of the manufacturer or his trade-mark,

b) Size and thickness,
c) Manufacturer's batch number, and
d) Quantity in m^2.

8. MARKING

8.1 Tiles shall be legibly marked on the back with the name of the manufacturer or his trade-mark and manufacturer's batch number.

8.1.1 Each box 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* 6.2.2)

SAMPLING AND CRITERION FOR CONFORMITY

A-1. LOT

A-1.1 All the tiles of the same type, size and from the same batch of manufacture, in one consignment shall constitute a lot.

A-2. SELECTION

A-2.1 The number of the tiles to be selected at random from the lot shall depend upon the size of the lot and shall be in accordance with col 1 to 4 of Table 3.

A-2.2 The tiles shall be selected at random from the lot, and in order to ensure the randomness of selection, random number tables* my be used. In case random number tables are not available, the following procedure may be adopted for the selection of tiles.

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

**See* IS : 4905-1968 Methods for random sampling.

TABLE 3 SAMPLE SIZE AND CRITERION FOR CONFORMITY

(*Clauses* A-2.1 *and* A-3.1)

No. of Tiles in the Lot	Sample	Sample Size	Cumulative Sample Size	Acceptance Number	Rejection Number
(1)	(2)	(3)	(4)	(5)	(6)
Up to 300	First	13	13	0	2
	Second	13	26	1	2
301 „ 500	First	20	20	0	2
	Second	20	40	1	2
501 „ 1 000	First	32	32	0	3
	Second	32	64	3	4
1 001 „ 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

A-3. CRITERION FOR CONFORMITY

A-3.1 The number of tiles in the first sample (*see* col 2 and 3 of Table 3), shall first be subjected to the acceptance tests (*see* **6.2.2**). If in the first sample the number of defective tiles, that is, those failing to satisfy any one or more of the acceptance tests is less than or equal to the corresponding acceptance number *a* (col 5 of Table 3), the lot shall be considered as conforming to the requirements of the acceptance tests. If the number of defective tiles in the first sample is more than or equal to the corresponding rejection number *r* (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 subjected to the acceptance tests. If in the combined sample, the number of defective tiles is less than or equal to the corresponding acceptance number *a*, the lot shall be considered as conforming, and if the number of defective tiles is more than or equal to the corresponding rejection number *r*, the lot shall be considered as not conforming.

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