IS 2690-2 (1992): Burnt clay flat terracing tiles-Specification, Part 2: Hand made [CED 30: Clay and Stabilized Soil Products for Construction]

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IS 2690 (Part 2) : 1992
(Reaffirmed 2002)

भारतीय मानक

पक्की मिट्टी के समतल टेरेसिंग टाइल – विशिष्टि

भाग 2 हस्तनिर्मित

(दूसरा पुनरीक्षण)

Indian Standard

BURNT CLAY FLAT TERRACING TILES — SPECIFICATION

PART 2 HAND-MADE

(Second Revision)

UDC 666·754

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

April 1992

Price Group 2

FOREWORD

This Indian Standard (Part 2) (Second Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Clay Products for Buildings Sectional Committee had been approved by the Civil Engineering Division Council.

Burnt clay flat terracing tiles, which may be hand-made or machine pressed, are used for flat roof finishing over lime concrete or cement concrete base, and depending on the degree of protection necessary, they are used in two or more courses. This standard was first published in 1964 and subsequently revised in 1975. It was brought out in two parts : Part 1 covering machine made tiles and Part 2 covering hand made tiles. The present revision has been taken up to incorporate the improvement found necessary in the light of usage of this standard and the suggestions made by various bodies implementing it.

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.

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.

AMENDMENT NO. 1 JUNE 2011
TO
IS 2690 (PART 2) : 1992 BURNT CLAY FLAT TERRACING TILES — SPECIFICATION

PART 2 HAND-MADE

(Second Revision)

(*Page* 2, *Annex* A):

a) Delete IS 3495 (Part 1) : 1992 alongwith its title.

b) Substitute the following for the existing title against IS 5454 : 1978:

'Methods for sampling of clay building bricks (*first revision*).'

(CED 30)

Reprography Unit, BIS, New Delhi, India

Indian Standard

BURNT CLAY FLAT TERRACING TILES — SPECIFICATION

PART 2 HAND-MADE

(Second Revision)

1 SCOPE

1.1 This standard (Part 2) lays down the requirements for hand-made burnt clay flat terracing tiles.

2 REFERENCES

2.1 The Indian Standards listed at Annex A are necessary adjuncts to the standard.

3 TERMINOLOGY

3.0 For the purpose of this standard, the definitions given in IS 2248 : 1992 shall apply.

4 GENERAL QUALITY

4.1 The terracing tile shall be made from good soil of even texture and shall be uniformly well burnt. They shall be uniform in shape and sizes and shall be free from irregularities, such as twists, bends, cracks and particles of stones.

5 DIMENSIONS, SHAPE, TOLERANCES AND WARPAGE

5.1 The size of terracing tiles and the tolerances shall be as given in **5.1.1** to **5.1.4**.

5.1.1 *Length*

250 mm to 150 mm in the stages of 25 mm.

5.1.2 *Width*

200 mm to 75 mm in the stages of 25 mm.

5.1.3 *Thickness*

25 mm to 50 mm in the stages of 5 mm.

5.1.4 *Tolerances*

The tolerances in length, width and thickness shall be $\pm$ 3 percent.

5.2 Warpage

The maximum warpage for the tiles measured as described in **5.2.1** shall not exceed 2 percent of the dimensions in any direction.

5.2.1 Place a straight-edge flat over the tile resting on a plane surface so as to leave maximum gap between the straight-edge and the surface of the tile. Judging by the naked eye, insert the measuring metallic wedge in the gap and measure the maximum value of gap.

6 WATER ABSORPTION

6.1 The water absorption by weight when tested according to the method described in IS 3495 (Part 2) : 1992 shall not exceed 20 percent.

7 FLEXURAL STRENGTH

7.1 The modulus of rupture in bending when tested by the method described in Annex B shall not be less than 1·5 N/mm^2.

8 SAMPLING

8.1 Sampling and the criteria for determining the suitability of the tiles shall be as given in IS 5454 : 1978.

9 MARKING

9.1 Each terracing tile shall be legibly and indelibly marked with the identification of the manufacturer or his trade-mark, if any; the marking shall not cover more than five percent of the area of the specimen. Each tile shall also be marked by symbol 'H' to indicate hand-made tile.

9.1.1 Each terracing tile may also be marked with the Standard Mark.

ANNEX A
(*Clause* 2.1)

LIST OF REFERRED INDIAN STANDARDS

IS No.	*Title*	*IS No.*	*Title*
2248 : 1992	Glossary of terms relating to structural clay products (*second revision*)	3495 (Part 2) : 1992	Method of tests of clay building bricks : Part 2 Determination of water absorption (*third revision*)
3495 (Part 1) : 1992	Method of tests of clay building bricks : Part 1 Determination of compression strength (*third revision*)	5454 : 1978	Method for sampling of clay building bricks

ANNEX B
(*Clause* 7.1)

DETERMINATION OF FLEXURAL STRENGTH

B-1 TEST SPECIMENS

B-1.1 Tiles shall be used for this test from the sample selected in the manner described in **8**.

B-2 APPARATUS

B-2.1 The apparatus (*see* Fig. 1) shall consist of two parallel self-aligning cylindrical steel bearers, with the bearing surface rounded to 40 mm diameter, and so placed that the distance between the centres could be altered. The load shall be applied through a third steel bearer of similar shape placed midway between the parallel to the supports. The length of all the bearers shall exceed the maximum width of the tile under test for square and rectangular tiles.

B-2.1.1 The loading device may consist of a bucket connected either directly or through levers to the loading arm. The loading shall be at a uniform rate of 450 to 550 N/min. Provision shall be made to arrest the flow of lead shots immediately the tile breaks.

B-2.2 Alternatively, a suitably modified hand operated compression testing machine with a minimum load frame capacity of 10 tons may be used (*see* Fig. 2). In this system the bearer assembly is mounted on a rigid mild steel plate and the third central loading bearing is fixed through a suitable dial micrometer) least count 0·25 mm) or an equally Sensitive devise to bear on the loading member or on the specimen at mid span. The specimen is supported on the bottom parallel bearers separated by a distance of minimum three-fourths (3/4) of the length of the tile.

B-2.2.1 The error in the load reading shall not exceed 2·2 N for loads up to 220 N and for greater load, the error shall not exceed 1 percent of the maximum load. The rate of loading should be uniform and vary in the range of 450-550 N/min (45 to 55 kg/min).

B-3 PROCEDURE

B-3.1 Test the tiles as described in **B-3.1.1** and **B-3.1.2**.

B-3.1.1 Soak the tiles in water at a temperature of 27 ± 3°C for 24 hours.

B-3.1.2 Support the tile evenly flat-wise on the bearers set, with a span equal to three-fourths the dimensions of the tile and resting on the natural bottom surface. Rectangular tiles shall be supported along longer face. To ensure uniform distribution of load at supports, provide suitable packing between the tile and the bearers. Apply the load with the direction of the load perpendicular to the span at a uniform rate of 450 to 550 N/min.

B-4 CALCULATION AND REPORT OF TEST RESULTS

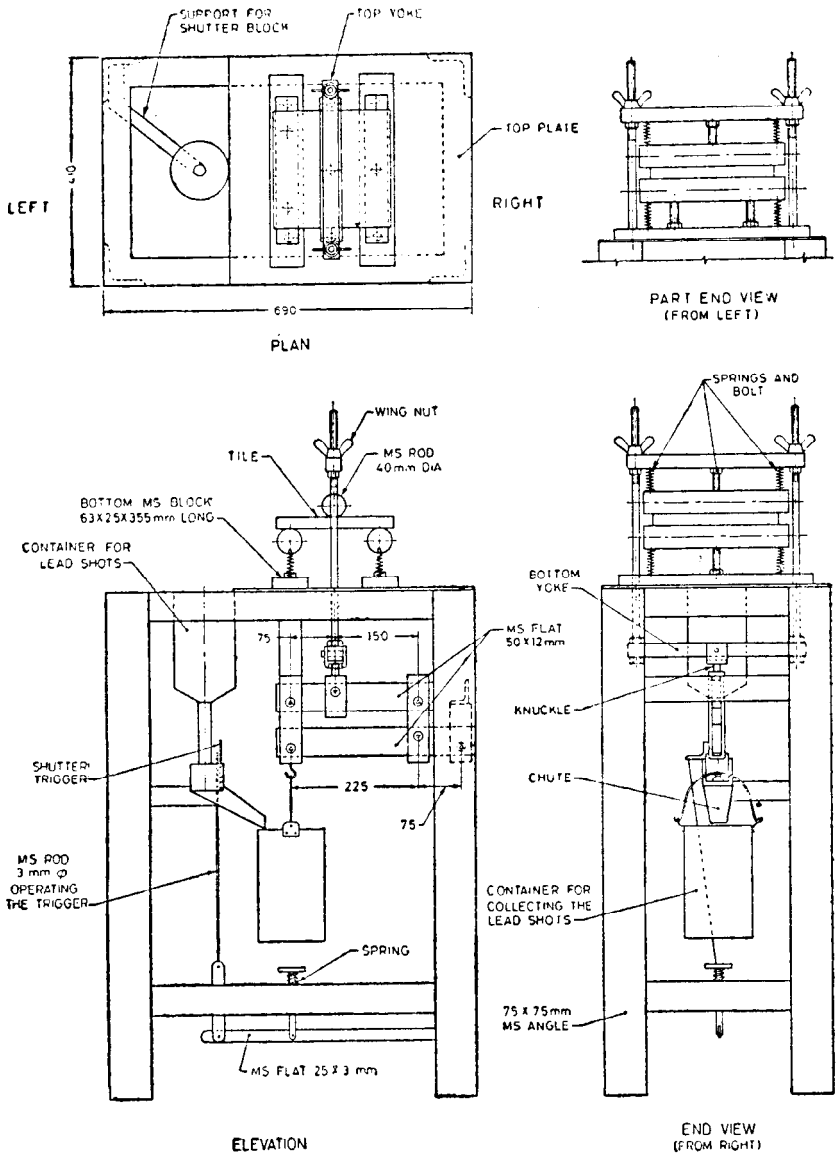
B-4.1 The flexural strength shall be calculated for each individual tile by the following formula:

$$\text{Flexural strength} = \frac{15\ WS}{bt^2}\ \text{N/mm}^2$$

where

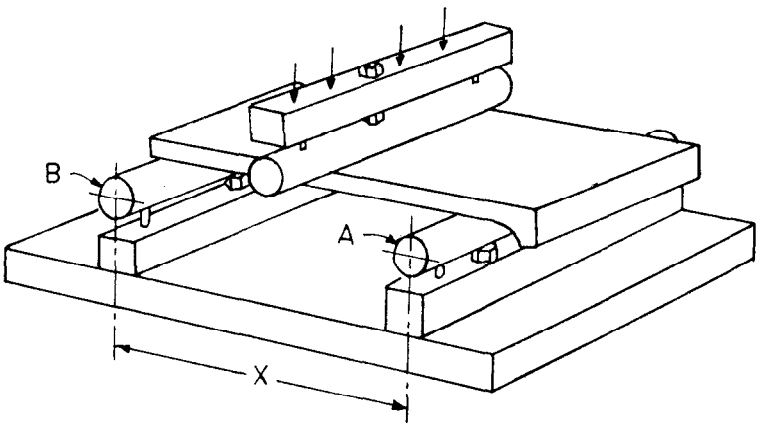
W = breaking load in kg;
S = span in mm (that is, three-fourths of tile);
b = width of tile in mm; and
t = thickness of tile in mm.

B-4.2 The average value shall be calculated.

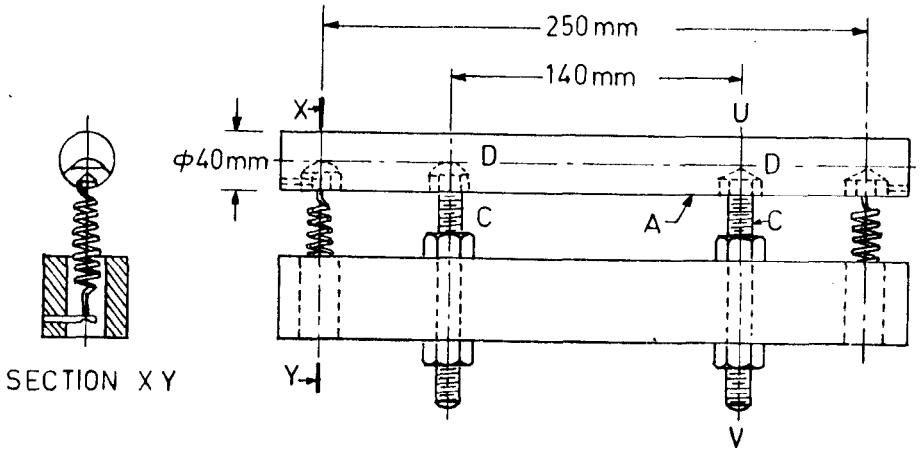


All dimensions in millimetres.

FIG. 1 TILE TESTING MACHINE

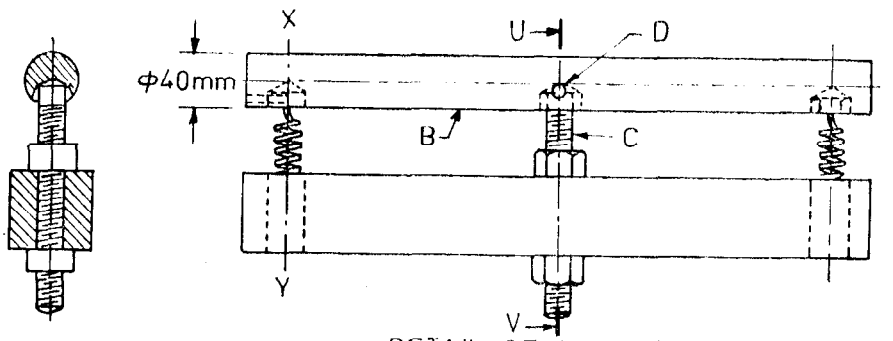


X = SPAN AS PER TILE SIZE



SECTION X Y

DETAIL OF BEARER A



SECTION U V

DETAIL OF BEARER B

FIG. 2 ESSENTIALS OF APPARATUS FOR TRANSVERSE TEST

Standard Mark

The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act, 1986* and the Rules and Regulations made thereunder. The Standard 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 BIS and operated by the producer. Standard marked products are also continuously checked by BIS for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

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.

Revision of Indian Standards

Indian Standards are reviewed periodically and revised, when necessary and amendments, if any, are issued from time to time. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition. Comments on this Indian Standard may be sent to BIS giving the following reference :

Doc : No. CED 30 (4991)

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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Printed at Printrade, New Delhi, India