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मानक

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IS 1077 (1992): Common Burnt Clay Building Bricks
-Specification [CED 30: Clay and Stabilized Soil Products
for Construction]



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भारतीय मानक

भवन निर्माण की सामान्य पकी मिट्टी की ईंटों की विशिष्टि

(पाँचवा पुनरीक्षण)

Indian Standard

COMMON BURNT CLAY BUILDING
BRICKS - SPECIFICATION

(*Fifth Revision*)

Fourth Reprint JANUARY 2005

UDC 666.762.712

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BUREAU OF INDIAN STANDARDS
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**AMENDMENT NO. 1 MAY 2008
TO
IS 1077 : 1992 COMMON BURNT CLAY BUILDING
BRICKS — SPECIFICATION**

(*Fifth Revision*)

(Page 3, clause 7.1.1, fourth line) — Insert 'by more than 15 percent' after 'class of brick'.

(CED 30)

Reprography Unit, BIS, New Delhi, India

FOREWORD

This Indian Standard (Fifth 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.

The common building bricks is not only one of the oldest but also the most extensively used building material in construction work. It is essentially a local building material and consequently there exist considerable variations in the quality of raw material, the process of manufacture and the quality of the finished product. Rapid building activity, to be on rational lines, needs a certain degree of uniformity in the construction materials. Standardization of the common building brick with regard to its quality and dimensions would substantially help in raising the quality of construction work and its speed.

Keeping in view the advantages of modular co-ordination, Indian standards specify the dimensions of standard bricks in 100 mm module as the basis of all dimensional standardization in regard to building components. This is also in conformity with the decision of Government of India to adopt metric system in the country. Considering the various issues regarding the manufacturing and other practices followed in the country, the Sectional Committee responsible for the preparation of this standard had specified modular size of the brick. Advantages that a modular brick has over traditional brick are many, such as:

- i) requires less drying area;
- ii) saving in space of floor area;
- iii) economy in cost of brick masonry;
- iv) saving in labour cost;
- v) less losses during handling, etc; and
- vi) less consumption of mortar.

However, it was brought to the notice of committee that there was sufficient demand for sizes other than modular sizes and that the manufacturers were meeting such demands at present. This had led to a situation where bricks satisfying other requirements of the standard, but not the requirements regarding dimensions were classified as not satisfying the requirements of the standard. Therefore, the committee reviewed the relevant clause of Indian Standards and decided to include the non-modular size of the brick in addition to the modular size specified in the standard at present. This relaxation will be for a period of four years from the publication of this standard and it is intended that the manufacturers and consumer organization can gradually switch over with the period to the modular sizes, which are the preferred sizes.

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

COMMON BURNT CLAY BUILDING BRICKS — SPECIFICATION

(Fifth Revision)

1 SCOPE

1.1 This standard lays down requirements for classification, general quality, dimensions and physical requirements of common burnt clay building bricks used in buildings.

NOTE — Burnt clay bricks having compressive strength less than 40 N/mm² (approx 400 kgf/cm²) are covered in this standard and for higher strength, see IS 2180 : 1988.

2 REFERENCES

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

3 TERMINOLOGY

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

4 CLASSIFICATION

4.1 The common burnt clay bricks shall be classified on the basis of average compressive strength as given in Table 1.

Table 1 Classes of Common Burnt Clay Bricks
(Clause 4.1)

Class Designation	Average Compressive Strength not Less Than	
	N/mm ²	(kgf/cm ²) (approx)
35	35.0	(350)
30	30.0	(300)
25	25.0	(250)
20	20.0	(200)
17.5	17.5	(175)
15	15.0	(150)
12.5	12.5	(125)
10	10.0	(100)
7.5	7.5	(75)
5	5.0	(50)
3.5	3.5	(35)

5 GENERAL QUALITY

5.1 Bricks shall be hand-moulded or machine-moulded and shall be made from suitable soils. They shall be free from cracks and flaws and nodules of free lime.

5.2 Hand-moulded bricks of 90 mm or 70 mm height shall be moulded with a frog 10 to 20 mm deep on one of its flat sides; the shape and size of the frog shall conform to either Fig. 1A or Fig. 1B (see 6.1.1 for *L*, *W* and *H*). Bricks of 40 mm height as well as those made by extrusion process may not be provided with frogs.

5.3 The bricks shall have smooth rectangular faces with sharp corners and shall be uniform in colour.

6 DIMENSIONS AND TOLERANCES

6.1 Dimensions

6.1.1 The standard modular size of common building bricks shall be as follows (Fig. 1A and 1B):

Length (<i>L</i>)	Width (<i>W</i>)	Height (<i>H</i>)
mm	mm	mm
190	90	90
190	90	40

6.1.2 The following non-modular sizes of the bricks may also be used (Fig. 1A and 1B):

Length (<i>L</i>)	Width (<i>W</i>)	Height (<i>H</i>)
mm	mm	mm
230	110	70
230	110	30

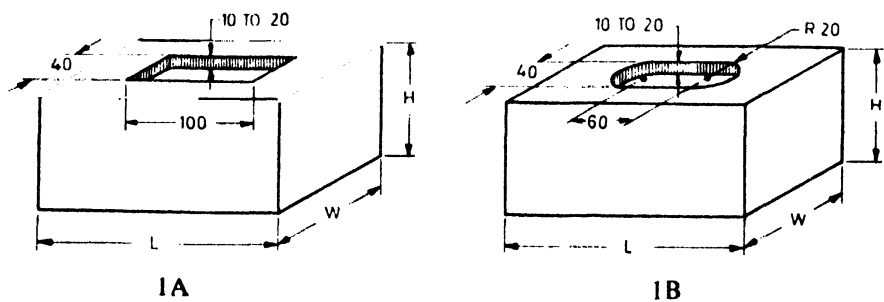
6.1.2.1 For obtaining proper bond arrangement and modular dimensions for the brickwork, with the non-modular sizes, the following sizes of the bricks may also be used:

Length (<i>L</i>)	Width (<i>W</i>)	Height (<i>H</i>)
mm	mm	mm
70	110	70 $\frac{1}{3}$ length brick

6.2 Tolerances

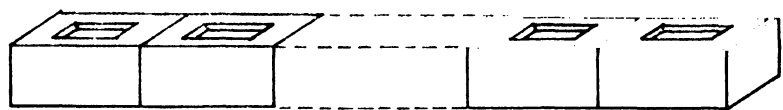
The dimensions of bricks when tested in accordance with 6.2.1 shall be within the following limits per 20 bricks:

- a) For modular size
 - Length 3 720 to 3 880 mm (3 800 \pm 80 mm)
 - Width 1 760 to 1 840 mm (1 800 \pm 40 mm)
 - Height 1 760 to 1 840 mm (1 800 \pm 40 mm)
 - (For 90 mm high bricks)
 - 760 to 840 mm (800 \pm 40 mm)
 - (For 40 mm high bricks)
- b) For non-modular size
 - Length 4 520 to 4 680 mm (4 600 \pm 80 mm)
 - Width 2 240 to 2 160 mm (2 200 \pm 40 mm)
 - Height 1 440 to 1 360 mm (1 400 \pm 40 mm)
 - (For 70 mm high bricks)
 - 640 to 560 mm (600 \pm 40 mm)
 - (For 30 mm high bricks)

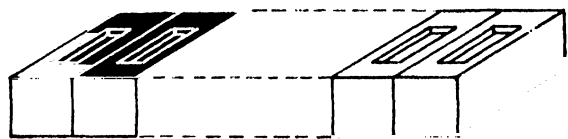


All dimensions in millimetres.

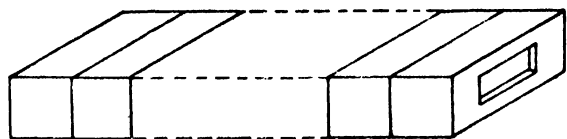
FIG. 1 SHAPE AND SIZE OF FROGS IN BRICKS



2A MEASUREMENT OF LENGTH



2B MEASUREMENT OF WIDTH



2C MEASUREMENT OF HEIGHT

FIG. 2 MEASUREMENT OF TOLERANCES OF COMMON BUILDING BRICKS

6.2.1 Twenty (or more according to the size of stack) whole bricks shall be selected at random from the sample selected under 8. All blisters, loose particles of clay and small projections shall be removed. They shall then be arranged upon a level surface successively as indicated in Fig. 2A, 2B and 2C in contact with each other and in a straight line. The overall length of the assembled bricks shall be measured with a steel tape or other suitable inextensible measure sufficiently long to measure the whole row at one stretch. Measurement by repeated application of short rule or measure shall not be permitted. If, for any reason it is found impracticable to measure

bricks in one row, the sample may be divided into rows of 10 bricks each which shall be measured separately to the nearest millimetre. All these dimensions shall be added together.

7 PHYSICAL REQUIREMENTS

7.1 Compressive Strength

The bricks, when tested in accordance with the procedure laid down in IS 3495 (Part 1) : 1992 shall have a minimum average compressive strength for various classes as given in 4.1.

7.1.1 The compressive strength of any individual brick tested shall not fall below the minimum compressive strength specified for the corresponding class of brick. The lot shall be then checked for next lower class of brick.

7.2 Water Absorption

The bricks, when tested in accordance with the procedure laid down in IS 3495 (Part 2) : 1992 after immersion in cold water for 24 hours, water absorption shall not be more than 20 percent by weight up to class 12.5 and 15 percent by weight for higher classes.

7.3 Efflorescence

The bricks when tested in accordance with the procedure laid down in IS 3495 (Part 3) : 1992

the rating of efflorescence shall not be more than 'moderate' up to class 12.5 and 'slight' for higher classes.

8 SAMPLING AND CRITERION FOR CONFORMITY

8.1 Sampling and criterion for conformity of common bricks shall be done in accordance with the procedure laid down in IS 5454 : 1978.

9 MARKING

9.1 Each brick shall be marked (in the frog where provided) with an indication of source of manufacture.

9.1.1 The manufacturer may also use the Standard Mark.

ANNEX A (Clause 2.1)

LIST OF REFERRED INDIAN STANDARDS

<i>IS No.</i>	<i>Title</i>	<i>IS No.</i>	<i>Title</i>
2180 : 1988	Specification for heavy-duty burnt clay building bricks (<i>second revision</i>)	3495 (Part 2) : 1992	Methods of tests of burnt clay building bricks : Part 2 Determination of water absorption (<i>third revision</i>)
2248 : 1992	Glossary of terms relating to structural clay products for buildings (<i>second revision</i>)	3495 (Part 3) : 1992	Methods of tests of burnt clay building bricks : Part 3 Determination of efflorescence (<i>third revision</i>)
3495 (Part 1) : 1992	Methods of tests of burnt clay building bricks : Part 1 Determination of compressive strength (<i>third revision</i>)	5454 : 1978	Methods for sampling of clay building bricks (<i>first revision</i>)

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This Indian Standard has been developed from Doc : No CED 30 (4978)

Amendments Issued Since Publication

Amendment No.	Date of Issue	Text Affected

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