IS 2180 (1988): Specification for heavy duty burnt clay building bricks [CED 30: Clay and Stabilized Soil Products for Construction]

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( Reaffirmed 2002 )

*Indian Standard*

# SPECIFICATION FOR HEAVY DUTY BURNT CLAY BUILDING BRICKS

*( Third Revision )*

UDC 691·421



**BUREAU OF INDIAN STANDARDS**
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NEW DELHI 110002

**Gr 1**

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# *Indian Standard*

# SPECIFICATION FOR HEAVY DUTY BURNT CLAY BUILDING BRICKS

## *( Third Revision )*

## 0. FOREWORD

**0.1** This Indian Standard ( Third Revision ) was adopted by the Bureau of Indian Standards on 28 January 1988, after the draft finalized by the Clay Products for Building Sectional Committee had been approved by the Civil Engineering Division Council.

**0.2** This standard was first published in 1962 and subsequently revised in 1970 and 1985. In this third revision class designation of the bricks has been based on the minimum compressive strength of the bricks expressed in $N/mm^2$ instead of $kgf/cm^2$. Furthermore sub-classifications A and B of bricks have been completely removed deleting requirements of sub-class B bricks and the tolerances on dimensions of bricks have been changed.

**0.3** Heavy-duty bricks ( also known as 'engineering bricks' ) are generally required for masonry in heavy engineering works, such as bridge structures, industrial foundations and multi-storeyed buildings. In view of the establishment of various mechanized plants, it is felt that some guidelines for the quality requirements of such bricks should be laid down, so that bricks of such strength could be judiciously utilized.

**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 requirements for classification, general quality, dimensions and physical properties of heavy duty burnt clay building bricks.

## 2. TERMINOLOGY

**2.1** For the purpose of this standard, definitions given in IS : 2248-1981* shall apply.

## 3. CLASSIFICATION

**3.1** The heavy duty bricks shall be classified on the basis of average compressive strength as given below:

| *Class Designation* | *Average Compressive Strength* | |
|---|---|---|
| | Not Less Than $N/mm^2$ ( $kgf/cm^2$ approximate ) | Less Than $N/mm^2$ ($kgf/cm^2$ approximate) |
| 40 | 40·0 (400) | 45 (450) |
| 45 | 45·0 (450) | — — |

*Glossary of terms relating to clay products for building ( *first revision* ).

## 4. GENERAL QUALITY

**4.1** Heavy duty burnt clay bricks shall be manufactured either by pressing or extrusion. They shall be made from a processed clay or clays blended in right proportions. The brick shall be burnt to the correct maturing temperature of the clay or clay blend, properly soaked, annealed and cooled under controlled conditions. When broken, the fractured surface of the brick shall show a uniformly dense structure free from large voids, laminations and lime particles. Two bricks when struck together shall emit a clear metallic ring.

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

## 5. DIMENSIONS AND TOLERANCES

**5.1 Dimensions** — The standard size of heavy duty clay building bricks shall be as follows:

| *Length* | *Width* | *Height* |
|---|---|---|
| mm | mm | mm |
| 190 | 90 | 90 |
| 190 | 90 | 40 |

**5.2** The maximum permissible tolerances on the dimensions specified in **5.1** shall be as follows:

| *Dimensions* | *Tolerance on Individual Bricks* |
|---|---|
| mm | mm |
| 190 | ± 4 |
| 90 | ± 2 |
| 40 | ± 2 |

## 6. PHYSICAL REQUIREMENTS

**6.1 Compressive Strength** — The bricks when tested in accordance with the procedure laid down in IS : 3495 ( Part 1 )-1976*, shall have a minimum average compressive strength for various classes as given in **3.1.**

NOTE — In case any of the test results for compressive strength exceed the upper limit of the class, the same shall be limited to upper limit of the class for the purpose of averaging.

**6.1.1** The compressive strength of any individual brick shall not fall below the minimum average compressive strength specified for the corresponding class of brick by more than 20 percent.

**6.2 Water Absorption** — The bricks when tested according to the procedure laid down in IS : 3495 ( Part 2 )-1976† after immersion in water for 24 hours, the average water absorption by mass shall not be more than 10 percent.

**6.2.1** If specified by the purchaser, 5 hours boiling test according to the procedure laid down in IS : 3495 ( Part 2 )-1976† may also be done. In that case, the average water absorption by mass shall not be more than 15 percent.

**6.3 Efflorescence** — The bricks when tested in accordance with the procedure laid down in IS : 3495 ( Part 3 )-1976‡, the rating of efflorescence shall be 'Nil'.

**6.4 Bulk Density** — The density of bricks shall not be less than 2·5 g/cm$^3$.

**6.4.1** For obtaining the bulk density, the brick shall be dried in a ventilated oven at a temperature of 105 to 115°C till it attains substantially constant mass. The brick shall be cooled to room temperature and its mass shall be obtained. Thereafter, the dimensions of the brick shall be measured accurately and the overall volume computed. The bulk density shall then be calculated as mass per unit volume.

## 7. SAMPLING AND CRITERION FOR CONFORMITY

**7.1** The method of sampling and the criterion for conformity shall be in accordance with the procedure laid down in IS : 5454-1978*.

## 8. MARKING

**8.1** Each brick shall be marked ( in the frog where provided ) with the manufacturers identification mark or initials.

**8.1.1** Each brick may also be marked with the Standard Mark.

NOTE — 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. Presence of this 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, has the further safeguard that the products as actually marketed are also continuously checked by BIS for conformity to that standard. 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.

*Methods of tests for burnt clay building bricks: Part 1 Determination of compressive strength ( *second revision* ).

†Methods of tests for burnt clay building bricks: Part 2 Determination of water absorption ( *second revision* ).

‡Methods of tests for burnt clay building bricks: Part 3 Determination of efflorescence ( *second revision* ).

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



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