भारतीय मानक
Indian Standard

IS 3495 (Part 2) : 2019

निर्माण के लिए पक्की मिट्टी की ईंट — परीक्षण पद्धति

भाग 2 जल अवशोषण ज्ञात करना

(चौथा पुनरीक्षण)

Burnt Clay Building Bricks — Methods of Tests

Part 2 Determination of Water Absorption

(Fourth Revision)

ICS 91.100.25

भारतीय मानक ब्यूरो
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October 2019 **Price Group 2**

Clay and Stabilized Soil Products for Construction Sectional Committee, CED 30

FOREWORD

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

Standard methods of testing burnt clay bricks are essential adjunct to the various burnt clay brick specifications. This standard (Part 2) was first published in 1966 and subsequently revised in 1973, 1976 and 1992. This standard in different parts lays down the procedure for the tests to evaluate the physical properties of different types of burnt clay bricks. Earlier, all the tests to evaluate the physical properties of burnt clay bricks were covered in one standard but for facilitating the use of this standard and future revisions, the revised standard has been brought out in different parts, each part covering different tests.

This Indian Standard is published in four parts. The other parts in this series are:

Part 1 Determination of compressive strength

Part 3 Determination of efflorescence

Part 4 Determination of warpage

This standard (Part 2) covers determination of water absorption in burnt clay bricks.

Following are the significant modifications incorporated in this revision:

a) 5 h boiling water absorption test has been added.

b) An additional parameter, saturation coefficient, has been incorporated.

c) Constant mass has been defined.

Efforts have also been made to update the other contents.

The composition of the Committee responsible for the formulation of this standard is given in Annex A.

In reporting the result of a test or analysis made in accordance with this standard, if the final value observed or calculated, is to be rounded off, it shall be done in accordance with IS 2 : 1960 ‘Rules for rounding off numerical values (*revised*)’.

Indian Standard

BURNT CLAY BUILDING BRICKS — METHODS OF TESTS

PART 2 DETERMINATION OF WATER ABSORPTION

(Fourth Revision)

1 SCOPE

This standard (Part 2) covers the method of determination of water absorption of burnt clay building bricks.

2 REFERENCE

The following standard contain provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent edition of the standard indicated below:

IS No.	*Title*
5454 : 1978	Methods of sampling of clay building bricks (*first revision*)

3 GENERAL

3.1 The dimension shall be measured to the nearest 1 mm.

3.2 All apparatus and testing equipment shall be calibrated at frequent intervals, as applicable to the respective testing equipment.

3.3 The number of specimens for the test shall be selected according to IS 5454.

4 METHODS

4.1 24-hour Water Absorption Test

4.1.1 *Apparatus*

A sensitive balance capable of weighing within 0.1 percent of the mass of the specimen, a water tank and a ventilated oven.

4.1.2 *Pre-conditioning*

Dry the brick specimens in a ventilated oven at a temperature of 105 to 115°C for not less than 24 h until two successive weighings at intervals of 2 h show an increment of loss not greater than 0.2 percent of the last previously determined mass of the specimen. Cool the specimens to room temperature and obtain their mass (M_1). Specimens warm to touch shall not be used for the purpose.

4.1.3 *Procedure*

Immerse completely dried specimens in clean distilled water at 15 to 30°C for 24 h. Remove the specimens and wipe out any traces of water with a damp cloth and weigh the specimens. Complete the weighing within 3 min after the specimens have been removed from water (M_2).

4.1.4 *Report*

Water absorption, percent by mass, after 24 h immersion in water is given by the following formula:

$$\frac{M_2 - M_1}{M_1} \times 100$$

4.1.4.1 The average 24-h water absorption shall be reported to the nearest 0.1 percent. Wherever specified in the product specification, the 24 h water absorption of all the individual brick specimens tested shall also be reported.

4.2 Five-hour Boiling Water Absorption Test

4.2.1 *Apparatus*

See **4.1.1.**

4.2.2 *Pre-conditioning*

4.2.2.1 The test specimens shall be the same specimens used in the 24 h water absorption test where required and shall be used in the state of saturation existing at the completion of that test.

4.2.2.2 Dry and cool the test specimens in accordance with **4.1.2** when performing the 5 h boiling water absorption test without previously conducting the 24 water absorption test.

4.2.3 *Procedure*

Submerge the specimens in clean distilled water at 15 to 30°C in such a manner that water circulates freely on all sides of the specimen. Heat the water to boiling point, within one hour, boil continuously for 5 h, and then allow to cool between 15 to 30°C by natural loss of heat. Remove the specimens and wipe out any traces of water with a damp cloth, and weigh the specimens. Complete the weighing within 3 min after the specimens have been removed from water (M_3).

4.2.4 *Report*

Water absorption, percent by mass, after 5 h boiling water test is given by the following formula:

$$\frac{M_3 - M_1}{M_1} \times 100$$

4.2.4.1 The average 5 h water absorption shall be reported to the nearest 0.1 percent. Wherever specified in the product specification, the 5 h boiling water absorption of all the individual bricks tested shall also be reported.

4.3 Saturation Coefficient

The saturation coefficient, the ratio of 24 h immersion cold water absorption to the 5 h boiling water absorption, is given by the following formula:

$$\frac{M_2 - M_1}{M_3 - M_1}$$

ANNEX A

(Foreword)

COMMITTEE COMPOSITION

Clay and Stabilized Soil Products for Construction Sectional Committee, CED 30

Organization	*Representative(s)*
CSIR-Central Building Research Institute, Roorkee	Shri A. K. Minocha (***Chairman***)
All India Brick & Tile Manufacturers Federation, New Delhi	Shri R. P. S. Chandel Shri R. K. Verma (*Alternate*)
Auroville Earth Institute, Auroville	Representative
Building Materials &Technology Promotion Council, New Delhi	Shri Sharad Gupta Shri Pankaj Gupta (*Alternate*)
Central Pollution Control Board, New Delhi	Shri B. Vinod Babu
Central Power Research Institute, Bengaluru	Representative
Central Public Works Department, New Delhi	Chief Engineer (CSQ) Shri Mathura Prasad (*Alternate*)
Central Soil and Materials Research Station, New Delhi	Shri U. S. Vidyarthi Shri Raj Kumar (*Alternate*)
CSIR-Advanced Materials & Processes Research Institute, Bhopal	Dr R. K. Morchhale Dr Manish Mudgal (*Alternate*)
CSIR-Central Building Research Institute, Roorkee	Shri A. K. Minocha Shri L. P. Singh (*Alternate*)
CSIR-Central Glass & Ceramic Research Institute, Kolkata	Dr Parvesh Agrawal Shrimati Asha T. Anil (*Alternate*)
CSIR-North-East Institute of Science and Technology, Jorhat	Dr Pinaki Sengupta
Delhi Development Authority, New Delhi	Chief Engineer (Design) Shri Lachhman Singh (*Alternate*)
Delhi Metro Rail Corporation, Delhi	Shrimati Papiya Sarkar
Development Alternatives, New Delhi	Dr Soumen Maity Shri Palas Kumar Haldar (*Alternate*)
Gujarat Engineering Research Institute, Vadodara	Shri B. M. Rao Shri Kamalanayan L. Dave (*Alternate*)
Hindustan Construction Company Ltd, Mumbai	Shri Satish Kumar Sharma Shri Rajiv Surekha (*Alternate*)
Housing and Urban Development Corporation Limited, New Delhi	Shri Akhilesh Kumar Shri Surendra Kumar (*Alternate*)
Indian Institute of Science, Bengaluru	Prof B. V. Venkatarama Reddy Dr K. S. Nanjunda Rao (*Alternate*)
Int Nirmata Parishad, Varanasi	Representative
Military Engineer Services, Engineer-in-Chief's Branch, Integrated HQ of MoD (Army), New Delhi	Shrimati Upinder Kaur Shri M. A. Ruperee (*Alternate*)
Ministry of Science & Technology, New Delhi	Shri Raj Kumar Joshi Shri Pawan Kumar (*Alternate*)
National Building Construction Corporation, New Delhi	Shri Anil Malla Shri M. K. Chawla (*Alternate*)

Organization	*Representative(s)*
National Test House, Kolkata	Shri D. V. S. Prasad Shri Naresh Gupta (*Alternate*)
NTPC Ltd, Noida	Shri Jitendra Kumar Shri Mohit Jhalani (*Alternate*)
Public Works Department, Chennai	Superintending Engineer Executive Engineer (*Alternate*)
Punjab State Council for Science and Technology, Chandigarh	Shri Pritpal Singh Shri Maganbir Singh (*Alternate*)
Shriram Institute of Industrial Research, Delhi	Dr Mukesh Garg Shri Rabindra Kumar Jena (*Alternate*)
The Energy and Resources Institute, New Delhi	Shri Sachin Kumar Shrimati Sudipta Singh (*Alternate*)
Unique Engineering Testing & Advisory Services, Surat	Shri Hitesh Desai Shri Nehal H. Desai (*Alternate*)
Wienerberger India Private Ltd, Bengaluru	Shri Kundan B. Dighe Shri D. J. Jagadeesha (*Alternate*)
In personal capacity (*651/37 Ganga Envlave, Sainik Colony, Roorkee 247667*)	Dr J. M. Bhatnagar
BIS Directorate General	Shri Sanjay Pant, Scientist 'F' and Head (Civil Engineering) [Representing Director General (*Ex-officio*)]

Member Secretary
Shri Milind Gupta
Scientist 'C' (Civil Engineering), BIS

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Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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