भारतीय राष्ट्रीय मानक संस्थान
NATIONAL STANDARDS BODY OF INDIA

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**भारतीय मानक ब्यूरो**
**BUREAU OF INDIAN STANDARDS**
उपभोक्ता मामले, खाद्य एवं सार्वजनिक वितरण मंत्रालय
MINISTRY OF CONSUMER AFFAIRS,
FOOD & PUBLIC DISTRIBUTION
9, Bahadur Shah Zafar Marg, New Delhi 110002

## व्यापक परिचालन मसौदा

**हमारा संदर्भ: सीईडी 04/टी-40** **26 जून 2025**

**तकनीकी समिति:** इमारती चूना और जिप्सम उत्पाद विषय समिति, सीईडी 04

**प्राप्तकर्ता:**

क) सिविल इंजीनियरी विभाग परिषद्, सीईडीसी के सभी सदस्य
ख) इमारती चूना और जिप्सम उत्पाद विषय समिति, सीईडी 04 के सभी सदस्य
ग) रूचि रखने वाले अन्य निकाय

प्रिय महोदय/महोदया,

निम्नलिखित भारतीय मानक का मसौदा संलग्न है:

| प्रलेख संख्या | शीर्षक |
|---|---|
| **सीईडी 04 (28235)WC** | **चूने से बने ब्लाक — विशिष्टि का भारतीय मानक मसौदा** [ IS 3115 का *तीसरा पुनरीक्षण* ] ICS 91.100.10 |

कृपया इस मानक के मसौदे का अवलोकन करें और अपनी सम्मतियॉ यह बताते हुए भेजे कि यदि यह मानक के रूप में प्रकाशित हो तो इस पर अमल करने में आपके व्यवसाय अथवा कारोबार में क्या कठिनाइयाँ आ सकती हैं ।

सम्मतियॉं भेजने की अंतिम तिथि : **28 जुलाई 2025**

सम्मति यदि कोई हो तो कृपया अधोहस्ताक्षरी को उपरिलिखित पते पर संलग्न फोर्मेट में भेजें या **manoj@bis.gov.in** पर ईमेल कर दें ।

यदि कोई सम्मति प्राप्त नही होती है अथवा सम्मति में केवल भाषा सम्बन्धी त्रुटि हुई तो उपरोक्त प्रलेख को यथावत अंतिम रूप दिया जाएगा। यदि सम्मित तकनीकी प्रकृति की हुई विषय समिति के अध्यक्ष के परामर्श से अथवा उनकी इच्छा पर आगे की कार्यवाही के लिए विषय समिति को भेजे जाने के बाद प्रलेख को अंतिम रूप दे दिया जाएगा ।

यह प्रलेख भारतीय मानक ब्यूरो की वैबसाइट **www.bis.gov.in** पर भी उपलब्ध हैं।

धन्यवाद ।

**भवदीय,**

**( द्वैपायन भद्र )**
**प्रमुख (सिविल इंजीनियरी)**

संगलन : उपरिलिखित

भारतीय राष्ट्रीय मानक संस्थान
NATIONAL STANDARDS BODY OF INDIA

भारत सरकार
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9, Bahadur Shah Zafar Marg, New Delhi 110002

**DRAFT IN WIDE CIRCULATION**

**Our Ref: CED 04/T-40** **26 June 2025**

**Technical Committee:** Building Lime and Gypsum Products, Sectional Committee, CED 04

**ADDRESSED TO:**

a) All Members of Civil Engineering Division Council, CEDC
b) All Members of CED 04
c) All others interests.

Dear Sir/Madam,

Please find enclosed the following document:

| Doc No. | Title |
|---|---|
| **CED 04 (28235)WC** | **Draft Indian Standard**<br>**Lime Based Blocks — Specification**<br>**(***Third Revision* of IS 3115) ICS 91.100.10 |

Kindly examine the draft standard and forward your views stating any difficulties which you are likely to experience in your business or profession, if this is finally adopted as National Standard.

Last Date for Comments: **28 July 2025**

Comments if any, may please be made in the attached format and mailed to the undersigned at the above address or preferably through e-mail to **manoj@bis.gov.in**.

In case no comments are received or comments received are of editorial nature, you may kindly permit us to presume your approval for the above document as finalized. However, in case of comments of technical in nature are received then it may be finalized either in consultation with the Chairman, Sectional Committee or referred to the Sectional Committee for further necessary action if so desired by the Chairman, Sectional Committee.

The document is also hosted on BIS website www.bis.gov.in**.**

Thanking you,

Yours faithfully,

( **Dwaipayan Bhadra** )
**Head (Civil Engineering)**

Encl: As above

## FORMAT FOR SENDING COMMENTS ON BIS DOCUMENTS

(Please use A-4 size sheet of paper only and type within fields indicated. Comments on each clause/sub-clause/table/fig etc. be started on a fresh box. Information in column 3 should include reasons for the comments and suggestions for modified working of the clauses when the existing text is found not acceptable. Adherence to this format facilitates Secretariat's work) {Please e-mail your comments to manoj@bis.gov.in}.

**Doc. No.:** **CED 04 (28235) WC**

**Title:** **Draft Indian Standard Lime Based Blocks — Specification**
(*Third Revision* of IS 3115) ICS 91.100.10

*LAST DATE OF COMMENTS*: **28/07/2025**

NAME OF THE COMMENTATOR/ORGANIZATION: _____

| Sl. No. | Clause/Para/Table/ Figure No. Commented | Comments/Modified Wordings | Justification of the Proposed Change |
|---|---|---|---|
| | | | |

**BUREAU OF INDIAN STANDARDS**

**DRAFT FOR COMMENTS ONLY**
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*Draft Indian Standard*

# LIME BASED BLOCKS — SPECIFICATION

**(***Third Revision* of IS 3115)
ICS 91.100.10

| | |
|---|---|
| Building Lime and Gypsum Products, Section Committee, CED 04 | Last Date of Comments **28 July 2025** |

FOREWORD

(*Formal Clauses will be added later*)

The development of alternative and sustainable building materials has become increasingly important in the context of environmental concerns, resource conservation, and the promotion of low-carbon construction practices. Lime based blocks are one such material that have gained renewed interest due to their sustainable benefits, historical usage, and compatibility with traditional and modern construction methods.

Lime based blocks are made from mixture of one or more of the constitutes like, lime, ordinary Portland cement, slag cement, Portland pozzolana cement, lime and pozzolana, and lime pozzolana mixture. The blocks are manufactured by various processes. These blocks are constructed with or without mortar plastering, however, in case of exterior walls plastering is recommended.

This standard was first published in 1965 and subsequently revised in 1978. During its first revision, the provisions given in IS 5498 : 1969 'Specification for lime cement-cinder hollow concrete blocks' were incorporated in this standard and IS 5498 was withdrawn. In addition, requirements like tolerances on dimensions, sampling and criteria for conformity, provision of manufacturer's certificate have also been incorporated.

This revision has been taken up to align the standard in line with present good practices being followed in the country and abroad. For revising this standard an R&D project was awarded to Dr B R Ambedkar National Institute of Technology (NIT) Jalandhar, funded by Bureau of Indian standards. Based on the research the principle modifications in this revision are as follows:

a) Use of additives has been permitted;
b) Range for requirement of density has been modified;
c) Water absorption test has been included;
d) Guidelines for the manufacturing have been provided;
e) Dimensional tolerance has been aligned with the similar products Indian standards; and
f) Reference of Indian Standards has been updated.

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 : 2022 'Rules for rounding off numerical values (*second revision*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

*Draft Indian Standard*

# LIME BASED BLOCKS — SPECIFICATION

*( Third Revision )*

## 1 SCOPE

This standard covers dimension, quality and strength requirement of lime based blocks (both hollow and solid) used as building material for masonry construction of walls, internal partitions, filler walls etc.

## 2 REFERENCES

The standards listed in Annex A contain provisions which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were 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 editions of these standards.

## 3 TERMINOLOGY

For the purpose of this standard, the following definitions shall apply.

**3.1 Block** — A masonry unit, whether solid or hollow, in which at least one of the external dimensions exceeds the corresponding dimension of a standard brick as specified in IS 3952, and which is of such size and weight that it can be conveniently handled by a single person. Additionally, to distinguish it from slabs and panels, the height of the block shall not exceed its length or more than six times its width.

**3.2 Block Density** — The density calculated by dividing the mass of a block by the overall volume, including holes or cavities and end recesses.

**3.3 Drying Shrinkage** — The difference between the length of a specimen which has been immersed in water and then subsequently dried to constant length, all under specified conditions, expressed as a percentage of the dry length of the specimen.

**3.4 Gross Area** — The total area occupied by a block on its bedding face, including areas of the hollow portions and end recesses.

**3.5 Hollow Block** — A block in which hollow area is greater than 25 percent but not greater than 50 percent of the gross cross-sectional area.

**3.6 Moisture Movement** — The difference between the length of the specimen when dried to constant length and the length when subsequently immersed in water, all under specified condition, expressed as a percentage of the dry length of the specimen.

**3.7 Solid Block** — A block which is hundred percent solid.

## 4 MANUFACTURING

**4.1** The manufacturing of lime based blocks involves operation such as mixing, moulding, pressing, and curing. The process begins with the dry mixing of raw materials such as lime (quicklime or hydrated lime), silica or sand, water, and optional additives such as fly ash or cement, then water will be added gradual to form a consistent, workable paste. Once the mix reaches the desired workability, it is transferred to the required dimensions and shape moulds. Mould are pressed by hydraulic, mechanical

or any other means of pressing. After pressing, and demoulding the blocks undergo curing, which may be done through air, water or any other method of curing. In air curing, the blocks are kept in a controlled environment with moderate humidity, allowing the lime to react with carbon dioxide in the air (carbonation), forming calcium carbonate and hardening the blocks. Alternatively, water curing involves spraying the blocks with water or submerging them in curing tanks. Guidelines may be taken from IS 10049 for the manufacturing of lime based blocks.

**4.2** Lime based blocks are manufactured solid as well as hollow. Hollow lime based blocks may contain one or more cavities with any shape and size.

**4.3** Lime based blocks can be manufactured with or without face keyed. The keying may be provided on one face or both.

**4.4** The ends of the blocks which form the vertical joints may be plain, tongued and grooved or double grooved as shown in Fig. 1.

**4.5** The size, shaped, face keyed and ends of the blocks as mention above may be manufactured other than that as per the agreement between manufacturer and purchaser.

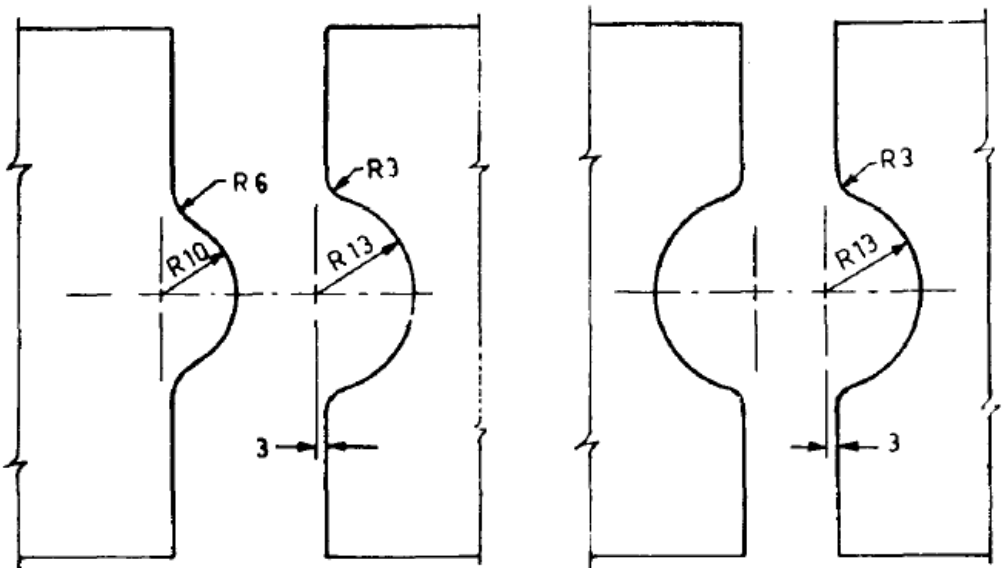


FIG. 1(A) TONGUE AND GROOVED JOINT FIG. 1(B) DOUBLE GROOVED JOINT

All dimensions in millimetres.

FIG. 1 TYPICAL PLAN OF JOINTS IN LIME BASED BLOCKS

## 5 MATERIALS

### 5.1 Lime

Lime shall conform to IS 712.

### 5.2 Cement

The cement shall conform to IS 269 or IS 455 or IS 1489 (Parts 1 and 2).

### 5.3 Calcined Clay Pozzolana

This shall conform to IS 1344.

### 5.4 Lime Pozzolana Mixture

The mixture shall conform to IS 4098.

### 5.5 Pulverized Fuel Ash

Pulverized fuel ash shall conform to IS 15648.

### 5.6 Coarse Aggregate

The coarse aggregate to be used in the manufacture of blocks shall be either natural stone aggregate conforming to IS 383 or broken brick (burnt clay) aggregate conforming to IS 3068 or cinder aggregate conforming to IS 2686 depending on the situation of use. Any other suitable aggregate of proven quality and performance may also be used for the purpose.

### 5.7 Water

The water to be used in the manufacture of blocks shall conform to the requirements specified in IS 456.

### 5.8 Additives

Any suitable additive that does not detrimental to the durability of lime based blocks may be added to enhance their performance and aesthetic properties. These additives may include gypsum, slag, admixtures, pigments, fibres or any other compatible materials.

## 6 DIMENSIONS

The actual size of the blocks when measured according to the procedure given in IS 2185 (Part 1) shall be as follows:

| | |
|---|---|
| Length | 390 mm |
| Width | 90 mm, 190 mm, 290 mm |
| Height | 90 mm, 190 mm |

The dimensions of the units are so designed that taking account of the thickness of mortar joints, they will produce wall lengths and heights which will conform to the principles of modular co-ordination. Sizes other than those mentioned above may be supplied by mutual agreement between the supplier and the purchaser.

## 7 PHYSICAL REQUIREMENTS

### 7.1 GENERAL

All blocks shall be sound, free from cracks, broken edges, distortion and other defects that would interfere with the proper placing of the unit.

### 7.2 Tolerances on Dimensions

**7.2.1** For the individual lime-based block the tolerance on the declared dimension is as given in Table 1.

**Table 1 Dimensional Tolerances**
(*Clause* 7.2.1)

| Sl No | Dimension | Tolerance |
|---|---|---|
| (1) | (2) | (3) |
| i) | Length and width | ± 1 percent |
| ii) | Height | ± 2 percent |

**7.2.2** Thickness at any point in Hollow block shall not be less than 40 ± 1 mm.

### 7.3 BLOCK DENSITY

The block density when determined according to Annex B of IS 2185 (Part 1) shall be in a range of 700 to 1 200 kg/m$^3$.

### 7.4 COMPRESSIVE STRENGTH

The minimum compressive strength of lime based blocks when determined in accordance with the procedure laid down in Annex C of IS 2185 (Part 1) shall be 3.5 MPa.

### 7.5 DRYING SHRINKAGE

The drying shrinkage of each of the blocks, when determined according to the procedure given in IS 2185 (Part 1) shall not exceed 0.1 percent.

NOTE — While preparing the specimen from hollow blocks for testing, the specimen with largest possible dimension that can be obtained may be used.

### 7.6 MOISTURE MOVEMENT

The moisture movement of lime based blocks on immersion in water shall not exceed 0.05 percent, when determined as per IS 2185 (Part 1).

### 7.7 Water Absorption

The lime based blocks, when tested in accordance with the procedure laid down in IS 3495 (Part 2), after immersion in cold water for 24 h, shall have water absorption not more than 15 percent by mass.

## 8 SAMPLING AND CRITERION FOR CONFORMITY

The sampling of the lime based blocks and the criterion for conformity shall be as given in IS 5454.

## 9 MANIJFACTURER'S CERTIFICATE

The manufacturer shall satisfy himself that the blocks conform to the requirements of this specification and, if requested, shall supply a certificate to this effect to the purchaser or his representative.

## 10 MARKING

**10.1** Each lime based blocks shall be marked with the manufacturers' identification mark or initials, preferably it should be marked on any face of the block or by any means.

### 10.2 BIS Certification Marking

The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act*, 2016 and the Rules and Regulations framed thereunder, and the product(s) may be marked with the Standard Mark.

## ANNEX A

(*Clause* 2)

## LIST OF REFERRED STANDARDS

| *IS No.* | *Title* |
|---|---|
| IS 269 : 2015 | Ordinary Portland cement — Specification (*sixth revision*) |
| IS 383 : 2016 | Coarse and fine aggregate for concrete — Specification (*third revision*) |
| IS 455 : 2015 | Portland slag cement — Specification (*fifth revision*) |
| IS 456 : 2000 | Plain and reinforced concrete — Code of practice (*fourth revision*) |
| IS 712 : 1984 | Specification for building limes (*third revision*) |
| IS 1344 : 1981 | Specification for calcined clay pozzolana (*second revision*) |
| IS 1489 | Portland pozzolana cement — Specification: |
| (Part 1) : 2015 | Fly ash based (*fourth revision*) |
| (Part 2) : 2015 | Calcined clay based (*fourth revision*) |
| IS 2185 (Part 1) : 2005 | Concrete masonry units — Specification: Part 1 hollow and solid concrete blocks (*third revision*) |
| IS 2686 : 1977 | Specification for cinder aggregates for use in lime concrete (*first revision*) |
| IS 3068 : 1986 | Broken brick (burnt clay) coarse aggregates for use in lime concrete — Specification (*second revision*) |
| IS 3495 (Part 2) : 2019 | Burnt clay building bricks — Methods of tests: Part 2 Determination of water absorption (*fourth revision*) |
| IS 3952 : 2013 | Burnt clay hollow bricks for walls and partitions — Specification (*third revision*) |
| IS 4098 : 1983 | Specification for lime — Pozzolana mixture (*first revision*) |
| IS 5454 : 2024 | Burnt clay bricks and burnt clay tiles — Methods of sampling (*second revision*) |
| IS 10049 : 1981 | Code of practice for manufacture of lime based blocks |
| IS 15648 : 2006 | Pulverized fuel ash for lime-pozzolana mixture applications — Specification |