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

व्यापक परिचालन मसौदा

हमारा संदर्भः सीईडी 04/टी-54 **04 दिसंबर 2024**

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

प्राप्तकर्ता :

क) सिविल इंजीनियरी विभाग परिषद्, सीईडीसी के सभी सदस्य
ख) सीईडी 04 के सभी सदस्य
ग) रूचि रखने वाले अन्य निकाय

प्रिय महोदय/महोदया,

निम्नलिखित भारतीय मानक का मसौदा संलग्न हैं:

प्रलेख संख्या	शीर्षक
सीईडी 04 (27017)WC	**बिल्डिंग लाइम्स के लिए परीक्षण के तरीके** **भाग 9 सुदृढ़ता का निर्धारण** **का भारतीय मानक मसौदा** [IS 6932 (भाग 9) का *पहला 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 ।

सम्मतियाँ भेजने की अंतिम तिथि : **04 जनवरी 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)

संलग्नक : उपरिलिखित

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

DRAFT IN WIDE CIRCULATION

Our Ref: CED 04/T-54 **04 December 2024**

TECHNICAL COMMITTEE: Building Limes 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 (27017)WC	**Draft Indian Standard** **Methods of Tests for Building Limes** **Part 9 Determination of Soundness** [*First Revision* of IS 6932 (Part 9)] 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: **04 January 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 comment 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 (27017)WC**

Title: **Draft Indian Standard Methods of Tests for Building Limes**
Part 9 Determination of Soundness
[*First Revision* of IS 6932 (Part 7)] ICS 91.100.10

LAST DATE OF COMMENT: **04/01/2025**

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
(*Not to be reproduced without the permission of BIS or used as an Indian Standard*)

Draft Indian Standard

METHODS OF TESTS FOR BUILDING LIMES PART 9 DETERMINATION OF SOUNDNESS

[*First Revision* of IS 6932 (Part 9)]
ICS 91.100.10

Building Lime and Gypsum Products Sectional Committee, CED 04	Last date of Comments; **04 January 2025**

FOREWORD

(Formal clauses will be added later)

The role of building limes in construction has been recognized and valued for centuries, from the ancient structures to modern structures. The use of lime as building materials is not only a testament to its versatility and durability but also to its sustainability and environmental benefits. As we continue to seek eco-friendly alternatives in construction, the relevance of lime-based products has become increasingly significant.

Building lime is used in construction for a variety of purposes such as lime washing, lime mortar, lime Plastering, lime Concrete, Rendering and Pointing, soil Stabilization, Restoration of Historic Buildings, Waterproofing and Decoration. Each of these forms of lime serves specific purposes in construction, from creating strong, durable mortar joints to providing breathable, flexible finishes that protect and preserve structures.

A number of Indian Standards on lime building materials covering specifications, code of practices, etc. have been prepared with a view to assisting the lime industry in its development. In line with that, methods of test for building lime, IS 6932 was prepared in eleven parts in the year 1973. In this revision it was decided to review and update the various existing test methods of building lime, taking into consideration the latest international practices and developments in this field and the current practices in the country. In this revision all the amendments are incorporated and reference of all Indian standards has been updated. Ambiguity in the procedure or reporting has been also removed.

This standards (Part 9) covers, the methods of test for methods of tests for building lime for determination of soundness. The others standards in the series are:

Part 1	Determination of insoluble residue in dilute acid and alkali, loss on ignition, insoluble residue in hydrochloric acid, silicon dioxide, ferric and aluminium oxide, calcium oxide and magnesium oxide
Part 2	Determination of carbon dioxide content
Part 3	Determination of residue on slaking of quicklime
Part 4	Determination of fineness of hydrated lime
Part 5	Determination of unhydrated oxide
Part 6	Determination of volume yield of quicklime

Part 7	Determination of compressive and transverse strengths
Part 8	Determination of workability
Part 10	Determination of popping and pitting of hydrated lime
Part 11	Determination of setting time of hydrated lime

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

METHODS OF TESTS FOR BUILDING LIMES
PART 9 DETERMINATION OF SOUNDNESS

(First Revision)

1 SCOPE

This standard (Part 9) covers the method of test for determination of soundness of building limes.

2 REFERENCES

The standards given below 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 agreement based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standard indicated below:

IS No.	*Title*
IS 269 : 2015	Ordinary Portland cement – Specification (*sixth revision*)
IS 460 (Part 1) : 2020	Test sieves — Specification: Part 1 Wire cloth test sieves (*fourth revision*)
IS 650 : 1991	Standard sand for testing cement – Specification (*second revision*)
IS 1070 : 2023	Reagent grade water – Specification (*fourth revision*)
IS 5513 : 1996	Vicat apparatus — Specification (*second revision*)

3 OBJECTIVE

The objective of this test is to determine the soundness of building limes to assess their suitability for construction. This test evaluates the lime potential for undesirable expansion, which could compromise the stability and durability of structures.

4 PRINCIPLE

The soundness test is based on the Le-Chatelier method, where a mortar made of hydrated lime, Portland cement, and standard sand is tested for expansion under controlled conditions and the expansion is measured as per conditions of the test.

5 APPARATUS

5.1 'Le-Chatelier' Apparatus – The 'Le-Chatelier' **Apparatus** conforming to IS 5513 shall be used.

5.2 Balance – Analytical balance with a least count of 0.01 g.

5.3 Vernier Caliper – capable of measuring to nearest 0.1 mm.

5.5 Steam bath

5.6 Trowel or Spatula

5.7 Non-Porous Plate

6 PREPARATION OF THE SAMPLE

6.1 General

6.1.1 Sampling shall be carried out as quickly as possible so that the material does not deteriorate. The total time occupied in mixing and preparation of the sample for the test should not exceed two hours. The samples shall be placed immediately in clean, dry, airtight containers. When testing is not to be carried out at once, the samples shall be kept in the airtight containers. Tools such as Shovel, auger, metal or plastic containers shall be of material free from rust and shall be alkali resistant.

6.1.2 If the sample contains lumps, crush the lime using a mortar and pestle or mechanical grinder to achieve a fine powder. Sieving is used to achieve a uniform particle size for accurate test results. Pass the dried and pulverized lime through a 2.36 mm sieve [*see* IS 460 (Part 1)]. This is a standard procedure for many tests, although specific tests may require different sieve sizes (for example, 300-micron sieve). Use a precision balance to weigh the required quantity of lime for each pat. The amount of lime needed will vary depending on the test being conducted. Typically, chemical tests may require 0.5 g to 5.0 g of sieved lime and physical test require 100 g to 5 000 g. Use distilled (*see* IS 1070) or deionized water to avoid contamination. Follow the specific water-to-lime ratio as required by the test method. The mixing can be done manually using a spatula or mechanically using a mixer. Ensure that the mixture is homogeneous and free of lumps. For some tests, a paste-like consistency may be required.

6.2 A suitable amount of hydrated lime shall be mixed with Ordinary Portland Cement (conforming to IS 269) and standard sand (conforming to IS 650) in the proportions given below:

a) *Hydrate lime* – any suitable amount of hydrated lime
b) *Ordinary Portland cement* – one third of the weight of hydrated lime
c) *Sand* – four times of the weight of hydrated lime

6.3 The ingredients shall be mixed dry and then gauged and mixed with 12 percent by mass of water calculated on the weight of dry mixture. It shall then be used for conducting the test.

7 PROCEDURE

Three ‘Le-Chatelier’ moulds shall be used for conducting the test. These shall be well greased internally. Each mould shall be placed upon a small non-porous plate and filled with the mortar under test, care being taken to keep the edges visibly open. The mould shall then be covered with another non-porous plate, upon which a small weight shall be placed. The three moulds shall be left undisturbed for 1 h. At the expiration of this period the distance separating the indicator points shall be measured and these moulds transferred to a damp air cupboard for a period of 48 h. They shall then be removed, with covers in place, from the damp air cupboard and placed in a suitable steam boiler, in which water is already boiling vigorously, and subjected to the continuous action of saturated stream at atmospheric pressure for a period of 3 h; but it shall not be immersed in water. At the end of this period, the moulds shall be removed from the steam and allowed to cool and the distances between the indicator points again measured. The increase, if any, over the former measurement shall in no case exceed 10 mm after the deduction of 1 mm (to allow for the expansion of the added cement) from the measured expansion. The value so obtained shall be recorded as the net expansion due to lime.

8 REPORT OF TEST RESULTS

The increase of distances between the indicator points shall be reported to the nearest 0.5 mm.