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-48 **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 (27008)WC	**बिल्डिंग लाइम्स के लिए परीक्षण के तरीके भाग 3 कलीचूना डालने पर अवशेषों का निर्धारण का भारतीय मानक मसौदा** [IS 6932 (भाग 3) 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-48 **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 (27008)WC	**Draft Indian Standard** **Methods of Tests for Building Limes** **Part 3 Determination of Residue on Slaking of Quicklime** [*First Revision* of IS 6932 (Part 3)] 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 (27008)WC**

Title: **Draft Indian Standard Methods of Tests for Building Limes**
Part 3 Determination of Residue on Slaking of Quicklime
[*First Revision* of IS 6932 (Part 3)] 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
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Draft Indian Standard

METHODS OF TESTS FOR BUILDING LIMES
PART 3 DETERMINATION OF RESIDUE ON SLAKING OF QUICKLIME

[*First Revision* of IS 6932 (Part 3)]
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 standard (Part 3) covers the methods of tests for building limes for determining the residue on slaking of quicklime. 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 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 9 Determination of soundness
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 3 DETERMINATION OF RESIDUE ON SLAKING OF QUICKLIME

(First Revision)

1 SCOPE

This standard (Part 3) covers the method of test for determination of residue on slaking of quicklime including isothermal slaking of the sample.

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 460 (Part 1) : 2020	Test sieves – Specification: Part 1 Wire cloth test sieves (*fourth revision*)
IS 712 : 1984	Specification for building limes (*third revision*)
IS 1070 : 2023	Reagent grade water – Specification (*fourth revision*)

3 OBJECTIVE

The objective of determining the residue on slaking of quicklime is to assess the purity and reactivity of the quicklime by measuring the amount of material that remains undissolved after the slaking process. This residue primarily consists of impurities or under-reacted lime that did not convert to calcium hydroxide ($Ca(OH)_2$) during slaking. A low residue content typically indicates high reactivity and purity, which are essential for efficient performance.

4 PRINCIPLE

The residue on slaking is determined by reacting a known mass of quicklime with an excess of water under controlled conditions. After slaking, the mixture is sieved, and the residue retained on the sieve is dried and weighed. The residue is then calculated as a percentage of the original sample mass, indicating the presence of impurities or under-reacted material in the quicklime.

5 APPARATUS AND REAGENTS

5.1 Slaking Vessel – A heat-resistant, non-reactive container with a lid, capable of holding the quicklime and water mixture.

5.2 Sieve – IS sieve as per IS 460 (Part 1).

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

5.4 Oven – Capable of attend the temperature of 150 °C with a least count of 0.1 °C.

5.5 Wooden Stirrer – For stirrer the mix.

5.6 Thermometer – To monitor the temperature of the slaking process.

5.7 Distilled Water – For slaking the quicklime and washing the residue.

6 SAMPLE PREPARATION

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, air-tight containers. When testing is not to be carried out at once, the samples shall be kept in the air-tight 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 test. 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 Isothermal Slaking of Sample and Preparation of Putty

6.2.1 The sample of quicklime shall be sieved through 2.36 mm IS Sieve [conforming to IS 460 (Part 1)] and the residue, if any, shall be broken in a manner so as to avoid undue production of fines and again sieved through 2.36 mm IS Sieve until the whole quantity passes through that sieve. This sample of lime shall be slaked isothermally by immersing in hot water maintained at a substantially uniform temperature during the actual slaking process. The quantity of water required for slaking shall be equal to 4 times the mass of quicklime for the majority of limes. However, with certain high calcium limes of high volume yield it may be found necessary to use 8 times the mass of the lime in order to obtain a product which could be conveniently handled.

6.2.2 When a slaking temperature has been specified by the vendor, place a sufficient quantity of water in a large clean slaking vessel (for example, a large circular bin approximately 45 cm in diameter and 50 cm deep) equipped with a thermometer, reading to 1 °C and with means for heating. Adjust the temperature of water to within ± 2 °C of the specified temperature, add 5 kg of the crushed quicklime sample in small quantities at a time, and then stir constantly and thoroughly at such a rate that not less than 5 min are required to introduce the whole quantity. During this process and a total period of 1 h, control the temperature of the mixture to within ± 2°C of the specified isothermal temperature by the addition of cold water or by the application of heat. Spray through a rose, whilst stirring rapidly, any such additional water so as to avoid excessive local chilling of the mixture. Allow the product to stand for 24 h from the time the quicklime was added to water and allow to cool gradually to room temperature during this period. Thoroughly stir it with a wooden stirrer at least twice during this period. The last stirring shall, however, be done within one hour before the expiration of the 24 h.

6.2.3 Where a slaking temperature has not been specified by the vendor, carry out slaking on two separate quantities, each of 5 kg of crushed quicklime, but with the temperature of water adjusted to and maintained at 50 °C in one case and 100 ± 2°C in the other case.

7 PROCEDURE

The product obtained after slaking on expiry of 24 h shall be used. Sieve first the supernatant liquid and then the remainder after stirring thoroughly with a wooden stirrer through 850 micron IS Sieve and then through 300-micron IS Sieve into a vessel similar to that used for the slaking. Fit the vessel with a temporary filter cloth such as a rectangular sheet of close woven unbleached calico of size about 1.0 m × 1.5 m, which has been previously washed free from dressing. Take special care to see that the contents of the slaking vessel are completely transferred on to the sieves by washing out the slaking vessel with a jet of water. Wash the residues on both the sieves with a moderate jet of water from a flexible tube, the whole operation taking not more than 30 min. The residue shall not be rubbed through the sieves. Dry the residue at 100 °C ± 10 °C to constant mass. Weigh separately the residue on each of the sieves.

8 REPORT OF TEST RESULTS

The residues on the respective sieves shall be reported as the percentage of mass of quicklime taken for the test.