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-53 **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 (27016)WC	**बिल्डिंग लाइम्स के लिए परीक्षण के तरीके भाग 8 व्यवहार्यता का निर्धारण का भारतीय मानक मसौदा** [IS 6932 (भाग 8) 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-53 **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 (27016)WC	**Draft Indian Standard** **Methods of Tests for Building Limes** **Part 8 Determination of Workability** [*First Revision* of IS 6932 (Part 8)] 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 (27016)WC**

Title: **Draft Indian Standard Methods of Tests for Building Limes**
Part 8 Determination of Workability
[*First Revision* of IS 6932 (Part 8)] 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 8 DETERMINATION OF WORKABILITY

[*First Revision* of IS 6932 (Part 8)]
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 8) covers the methods of test for methods of tests for building limes for determination of workability. The others standards in the series are:

Part 1	Determination of insoluble residue, loss on ignition, insoluble matter, 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 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 8 DETERMINATION OF WORKABILITY

(First Revision)

1 SCOPE

This standard (Part 8) covers the method of test for determination of workability 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 1070 : 2023	Reagent grade water – Specification (*fourth revision*)
IS 2250 : 1981	Code of practice for preparation and use of masonry mortars (*first revision*)
IS 6932 (Part 6) : 1973	Method of test for building limes: Part 6 Determination of volume yield of quicklime

3 OBJECTIVE

The objective this test is to provide a standardized method for determining the workability of building limes. Workability is a vital property that influences the ease of handling, application, and performance of lime in construction, including its role in mortars and plasters.

4 PRINCIPLE

Workability of building limes is based on evaluating the spread of lime putty under controlled conditions using a standard flow table. The material, adjusted to a standard consistency, is subjected to repeated impacts (bumps) on the flow table, and the resulting spread is measured. The workability is assessed by the number of bumps required to achieve a specified spread diameter.

5 APPARATUS

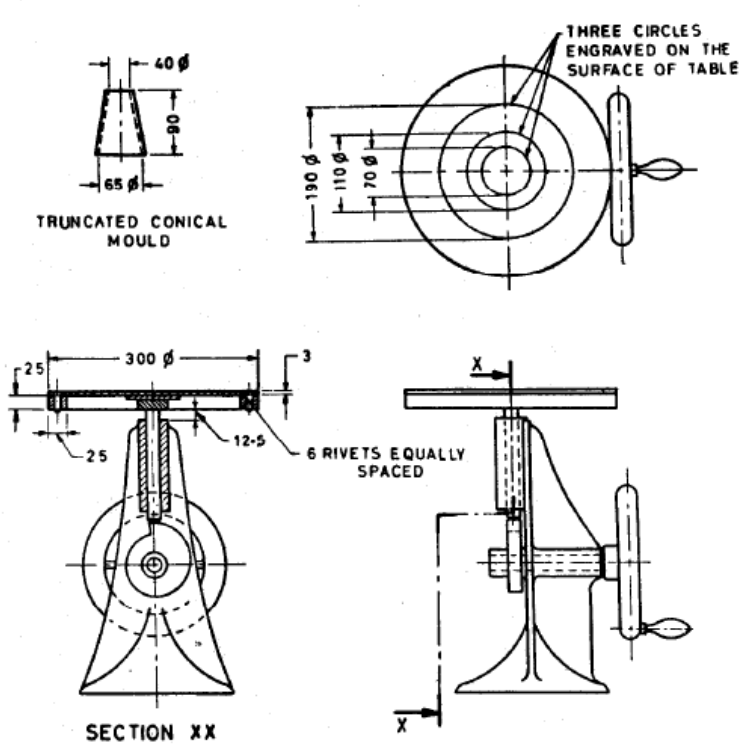
5.1 The apparatus shall consist of a standard flow table and a truncated conical metallic mould. (*see* Fig.1)

5.1.1 The standard flow table (*see* Fig. 1) shall consist essentially of a horizontal smooth table top made of mild steel, ground and polished on the surface. The tabletop shall be 30 cm in diameter and 3 mm thick mounted on a vertical shaft, which can be raised and then allowed to fall freely by a cam the fall being exactly 12.5 mm. A cast iron rim 25 mm square in cross-section and 300 mm external diameter shall be securely fixed under the edge of the tabletop with 6 rivets spaced symmetrically apart. Three circles having diameters of 70 mm, 110 mm and 190 mm respectively shall be engraved on the surface of the table and concentric with it. The engraved lines shall be filled with wax polished flush with the surface of the metal. The length of fall shall be as defined by a shoulder on the shaft coming in contact with the top of the cast iron to steel body of the instrument, the contact being, therefore, metal to metal. The total mass of the moving part (table top, loading rim, shaft, etc.) free to fall, shall be

approximately 7 kg. The mass of the body, with cam shaft and cam handle, etc shall be approximately 19 kg.

5.1.2 The flow table shall stand unattached in the centre of a brick, stone or concrete pier at least 35 cm square, built on a firm foundation, and upon which the base of the table shall stand firmly without any trace of rocking or chattering. The height of the pier shall be 80 cm and its top shall consist of 5 cm thick sand cement mortar (3:1) with its surface finished smooth with a steel trowel.

5.1.3 The mould for preparing the test specimen shall consist of a truncated conical mould of sheet metal with internal diameter of 40 cm at its narrower end, an internal diameter of 65 cm at its wider end and 9.0 cm in height. Its inside and the ends shall be smooth. In addition, the ends shall be plane.



All dimensions in millimetres.

FIG. 1 STANDARD FLOW TABLE AND TRUNCATED CONICAL MOULD

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 The temperature of the material under test and of the flow table and immediate surroundings shah be maintained at 27 °C ± 2 °C during the test.

6.3 In case of quicklime the putty shall be prepared in accordance with of IS 6932 (Part 6).

6.4 In the case of hydrated lime, the lime putty shall be prepared by thoroughly mixing the hydrated lime with an equal mass of clean water at a temperature of 27 °C ± 2 °C, 24 h before the subsequent operations. A convenient quantity of hydrated lime to be taken for this purpose shall be 500 g. At the expiry of 24 h the soaked material shall be thoroughly mixed and knocked up to produce a plastic putty. A mixer of the type given in IS 2250 shall be used for the ‘knocking up‘, the material being passed twice through this mixer.

6.5 The specimen of material for testing shall be prepared by filling the metallic mould specified under **5.1.3** such that no air bubbles or voids are retained inside. Before each test the mould shall be rinsed out with clean water, allowed to drain and shaken to remove superfluous water.

6.6 The lime putty prepared in accordance with **6.3** or **6.4**, shall be adjusted to standard plastering consistency, which shall be that indicated by an average spread of the lower part of the lime putty to 11.0 cm with a permissible deviation of not more than 0.1 cm, when subjected to one bump on the standard flow table. When first tested if the consistency is too stiff, more water shall be added, and if too wet, a small portion of the water shall be withdrawn by placing the material for a short period on a clean absorbent surface. The test for workability shall then be carried out immediately as described in **7**.

7 PROCEDURE

7.1 The shaft and shoulder of the standard flow table shall be carefully wiped clean and the shaft oiled with a few drops of thin mineral oil. The top of the table shall be clean and completely dry. The cone of material prepared in accordance with **6.5** shall be applied to the centre of the table with the aid of the mould and the mould carefully withdrawn. No substantial amount of the material under test shall remain adhering to the interior of the mould after removal. Otherwise the test shall be invalidated and shall be repeated.

7.2 The handle of the flow table shall be turned steadily and evenly at the rate of approximately one turn per second, without jerking or lingering at any point in a revolution. The average spread of the material shall be determined by measuring three diameters at approximately 60° apart and taking the average. Care shall be taken to avoid any undue exposure of the material.

7.3 The workability shall be estimated by noting the number of bumps required to attain an average spread to 190 mm, the material having been already adjusted to standard consistency as indicated under **6.6** by the spread after one bump to 110 mm.

8 REPORT OF TEST RESULTS

The number of bumps required to attain an average spread to 190 mm shall be reported.