**भारतीय मानक ब्यूरो**
(उपभोक्ता मामले, खाद्य एवं सार्वजनिक वितरण मंत्रालय, भारत सरकार)
**BUREAU OF INDIAN STANDARDS**
*(Ministry of Consumer Affairs, Food & Public Distribution, Govt. of India)*

मानक भवन, 9, बहादुर शाह ज़फर मार्ग, नई दिल्ली – 110002
**Manak Bhawan, 9, Bahadur Shah Zafar Marg, New Delhi – 110002**
Phones: 23230131 / 2323375 / 23239402
Website: www.bis.org.in . www.bis.gov.in

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## व्यापक परिचालन मसौदा

**हमारा संदर्भ : सीईडी 06/टी- 46**                    **10 मई 2025**

**तकनीकी समिति :** पत्थर विषय समिति, सीईडी - 06

**प्राप्तकर्ता :**

क) सिविल इंजीनियरी विभाग परिषद्, सीईडीसी के सभी सदस्य

ख) सीईडी 06 के सभी सदस्य

ग) रूचि रखने वाले अन्य निकाय

प्रिय महोदय/महोदया,

निम्नलिखित भारतीय मानक का मसौदा संलग्न हैं:

| प्रलेख संख्या | शीर्षक |
|---|---|
| **सीईडी 06 (27720)WC** | **इंजीनियर्ड पत्थरों — परीक्षण की विधियां का भारतीय मानक कार्यकारी मसौदा**<br>**भाग 2 अनुप्रस्थ सामर्थ्य का निर्धारण**<br>ICS 91.100.99, 91.100.15 |

कृपया इस मानक के मसौदे का अवलोकन करें और अपनी सम्मतियाँ 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: 09/08/2025**

टिप्पणियाँ, यदि कोई हों, बीआईएस ई-गवर्नेंस पोर्टल https://www.services.bis.gov.in/php/BIS_2.0/dgdashboard/draft/darftdetail/63/3/CED के माध्यम से ऑनलाइन भेजी जा सकती हैं।

वैकल्पिक रूप से, टिप्पणियाँ संलग्न प्रारूप में भी दर्ज की जा सकती हैं और ced06@bis.gov.in या divya.s@bis.gov.in पर ईमेल की जा सकती हैं।

*आपको अपनी टिप्पणियाँ प्रस्तुत करने के लिए लॉगिन करना पड़ सकता है, कृपया लॉगिन बनाएं।*

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

ह/-

**(दिव्या एस.)**
सदस्य सचिव सीईडी 06
वैज्ञानिक 'डी'(सिविल इंजीनियरिंग)
ई-मेल: **divya.s@bis.gov.in**

**संलग्न: उपरलिखित**

भारतीय मानक ब्यूरो
(उपभोक्ता मामले, खाद्य एवं सार्वजनिक वितरण मंत्रालय, भारत सरकार)
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## WIDE CIRCULATION DRAFT

**Our Reference: CED 06/T- 46**                                     **10 June 2025**

**Technical Committee: Stone Sectional Committee, CED 06**

**Addressed To:**
   a) All Members of Civil Engineering Division Council, CEDC
   b) All Members of CED 06
   c) All others interested

Dear Sir/Madam,

   Please find enclosed the following document:

| *Doc No.* | *Title* |
|---|---|
| **CED 06 (27720) WC** | **Indian Standard on Engineered Stones–Method of tests Part 2 Determination of Transverse Strength** <br> ICS 91.100.99, 91.100.15 |

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:   09 August 2025**
   Comments if any, may be sent online through the BIS e-governance portal at https://www.services.bis.gov.in/php/BIS_2.0/dgdashboard/draft/darftdetail/63/3/CED .

   Alternatively, comments may also be recorded in the enclosed format and emailed at ced06@bis.gov.in  or at divya.s@bis.gov.in.

   *You may be required to login to submit your comments, kindly create a login.*

   In case no comments are received or comments received are of editorial nature, you will 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,

                                                                          Sd/-

                                                                    (**Divya S.**)
                                                       Member Secretary CED 06
                                                    Scientist 'D' (Civil Engineering)
                                                     E-mail: **divya.s@bis.gov.in**

**Encl: As above**

## FORMAT FOR SENDING COMMENTS ON THE DOCUMENT

[Please use A4 size sheet of paper only and type within fields indicated. Comments on each clause/sub-clause/ table/figure, etc, be stated on a fresh row. Information/comments should include reasons for comments, technical references and suggestions for modified wordings of the clause. **Comments through https://www.services.bis.gov.in/php/BIS_2.0/WCDraft/comment_pdraft.php shall be appreciated**.]

**Doc. No.**: CED 06(27720)WC                    **BIS Letter Ref**: CED 06/T- 46

**Title:** Engineered Stones– Method of tests Part 2 Determination of Transverse Strength

Last date of comments: **09 August 2025**

**Name of the Commentator/ Organization**: _____

| Clause/ Para/ Table/ Figure No. commented | Comments/Modified Wordings | Justification of Proposed Change |
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*NOTE- Kindly insert more rows as necessary for each clause/table, etc*

# 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*

## ENGINEERED STONES–METHOD OF TEST
## PART 2 DETERMINATION OF TRANSVERSE STRENGTH

### ICS 91.100.99

| | |
|---|---|
| Stones Sectional Committee, CED 06 | Last date of comments<br>**09 August 2025** |

FORWARD

*Formal clause will be added later.*

Engineered stones are increasingly utilized in construction and decorative applications. To ensure their performance and suitability, it is necessary to ascertain their mechanical properties. This standard has been formulated to provide a standardized method for determining the transverse strength of engineered stones.

This Part 2 of the standard specifically covers the Determination of Transverse Strength. It lays down the procedure for determining the transverse strength of engineered stone flat products under four-point loading. The standard outlines key aspects of the test procedure, including the principle of the test, requirements for sampling and test specimens (including dimensions and tolerances), specimen conditioning (drying to constant mass and cooling), necessary apparatus, the detailed test procedure (including measurement of specimens and application of load at a constant stress rate), and the evaluation and reporting of test results

In the preparation of this standard, significant assistance has been derived from BS EN 14617-2:2008 'Agglomerated stone — Test methods — Part 2: Determination of flexural strength (bending)'.

This standard contributes to the United Nations Sustainable Development Goal 11 'Sustainable cities and communities' towards strengthening the efforts to protect and safeguard the world's cultural and natural heritage.

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 measurement 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.

*Wide Circulation Draft Indian Standard*

**ENGINEERED STONES–METHOD OF TESTS
PART 2 DETERMINATION OF TRANSVERSE STRENGTH**

(*Proposed New Standard*)

**1 SCOPE**

This standard lays down the procedure for determination of transverse strength of engineered stone flat products under four-point loading.

**2 SELECTION OF SAMPLES**

**2.1** The sample shall be selected to represent a true average of the type or grade of stone under consideration.

**2.2** At least six specimens shall be selected from a homogeneous batch. The surface finish of the faces of the faces of the specimens shall be sawn, honed, or polished.

> NOTE–If required, the test specimens may also be tested with other surface finishes like flamed, sandblasted etc.

**2.3** The surface intended for use shall be in contact with the two loading rollers.

**3 TEST SPECIMENS AND CONDITIONING**

**3.1** The total length $L$ shall be 350 ± 0.5 mm.

**3.2** The thickness $h$ shall be as per the expected final product subject to a max of 50 mm.

**3.3** The distance between the supporting rollers $l$ shall always be 25 mm shorter than the total length $L$.

**3.4** The width $b$ shall be at least 50 ± 0.3 mm and in no case, shall it be less than the thickness.

**3.5** The tolerance on the distance between the supporting rollers $l$ shall be ±1 mm of the nominal dimension.

**3.6** The faces shall not depart from perpendicular to the axis of the specimen by more than 2 percent with a maximum of 2 mm difference when measuring in any direction.

**3.7** The specimens shall be conditioned at room temperature 27 ± 5 °C for 24 ± 2 h.

**3.8** For engineered stones with cement or cement and polymer as binder. the specimens shall be dried at 65 ± 5 °C to a constant mass as per **3.9**.

**3.9** Constant mass is reached when the difference between two consecutive mass measurements carried out 24 ± 2 h apart is no greater than 0.1 percent.

**3.10** After drying and prior to testing the specimens shall be stored at 27 ± 2 °C until

the thermal equilibrium is reached. After that the test shall be performed within 24 h.
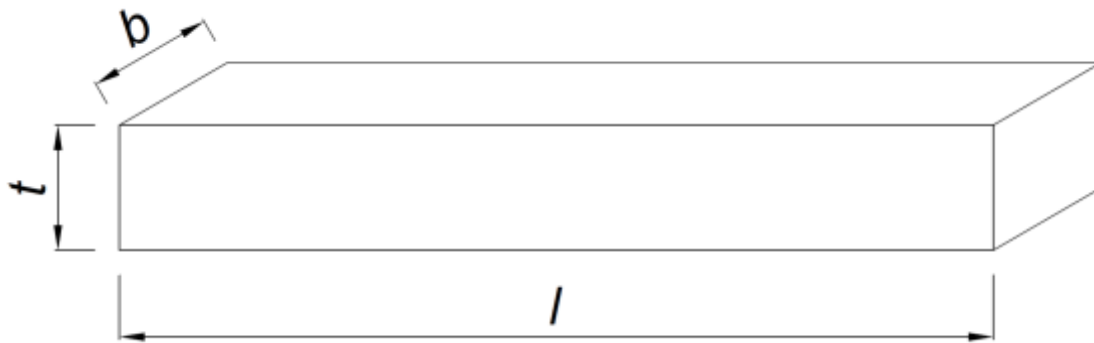


where

  $l$ = 350 ± 0.5 mm,
  b = 50 ± 0.3 mm and not less than t,
  t = actual job thickness, but not more than 50 mm.

FIG. 1 SAMPLE SIZE

## 4  APPARATUS

A suitable arrangement for loading and supporting sample is shown in Fig. 2.  A suitable load frame which can apply the required load accurately to 0.01 kN with one slightly rotatable supporting roller and a second supporting and two pivotable loading rollers .

## 5 PROCEDURE

**5.1** Each test specimen to be tested shall be evenly–supported upon two self-aligning bearers 25 mm in diameter. The supporting condition of the bearers shall be as per the Fig. 2. Loading is applied through two loading rollers spaced at $L/3$ from each support.

**5.2** The load is increased uniformly at a rate of 0.25 ± 0.05 MPa/s until the specimen breaks. Record the breaking load to the nearest 10 N and the point of fracture.

**5.3** If the point of failure falls outside the point of loading towards the supports beyond the middle $L/3$, the results of the tests shall be discarded, and additional sample shall be tested.

KEY
1. LOADING ROLLER ( CAPABLE OF ROTATION AND BEING INCLINED )
2. SUPPORTING ROLLER
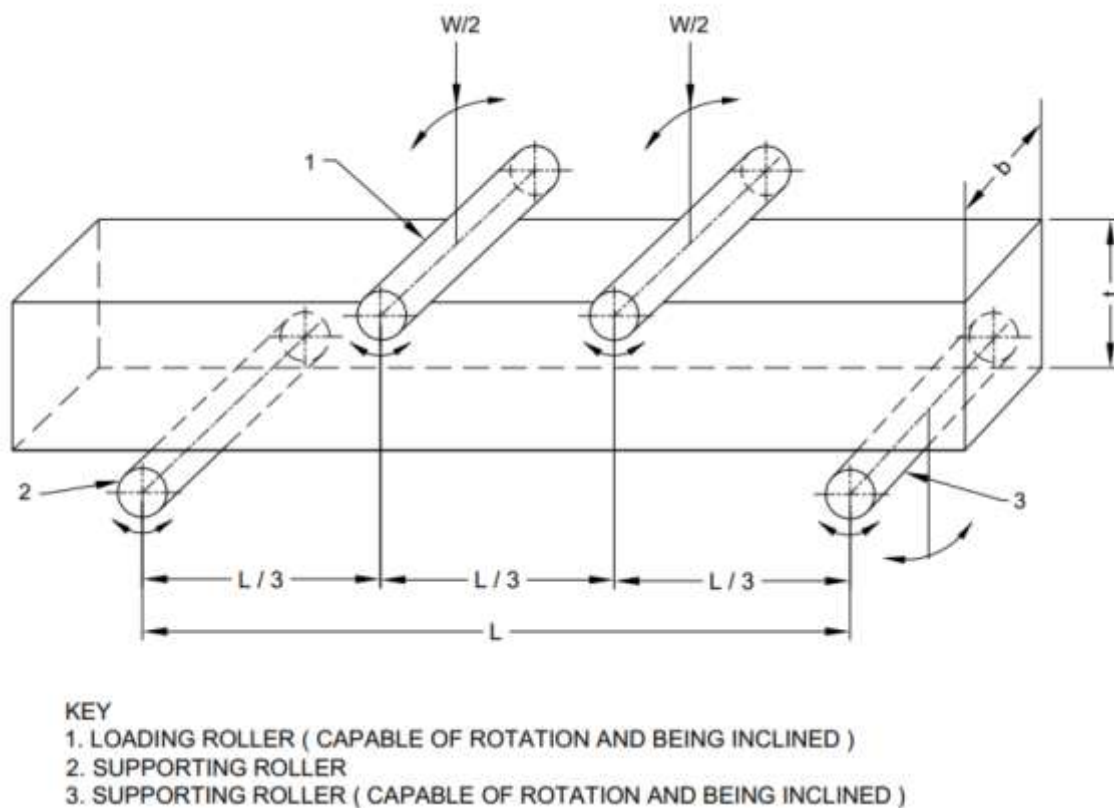3. SUPPORTING ROLLER ( CAPABLE OF ROTATION AND BEING INCLINED )

FIG 2. DIAGRAMMATIC VIEW OF A SUITABLE APPARATUS FOR TRANSVERSE STRENGTH DETERMINATION

## 6 EVALUATION AND REPORT OF TEST RESULTS

**6.1** The transverse strength R of each specimen is calculated using the formula:

$$R = \frac{WL}{bt^2}$$

where,
   $R$ = Transverse strength, in MPa,
   $W$ = Central breaking load, in N,
   $L$ = length of span, in mm,
   $b$ = width of the test specimen at the section of failure, in mm.
   $t$ = depth of the test specimen at the section of failure, in mm.

**6.2** The transverse strength of the sample shall be expressed in MPa and shall be reported to the nearest 0.1 MPa.

**6.3** Identification of the sample, date when the sample was taken and type of stone shall be reported.

**6.4** The size and shape of the test specimen used in the test shall be indicated.