

**भारतीय मानक ब्यूरो**

(उपभोक्ता मामले, खाद्य एवं सार्वजनिक वितरण मंत्रालय, भारत सरकार)

**BUREAU OF INDIAN STANDARDS**

(Ministry of Consumer Affairs, Food &amp; Public Distribution, Govt. of India)

मानक भवन, 9, बहादुर शाह ज़फ़र मार्ग, नई दिल्ली - 110002  
Manak Bhawan, 9, Bahadur Shah Zafar Marg, New Delhi - 110002

Phones: 23230131 / 2323375 / 23239402

Website: [www.bis.org.in](http://www.bis.org.in) , [www.bis.gov.in](http://www.bis.gov.in)**प्रारंभिक मसौदा****हमारा संदर्भ : सीईडी 06/टी-43****01 अक्टूबर 2024****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 है:

प्रलेख संख्या	शीर्षक
सीईडी 06 (26667)P	पॉलिश किए गए इमारती पत्थर — विशिष्टता भाग 2 संगमरमर और इसी तरह के पत्थर (IS 14223 का प्रस्तावित भाग 2) ICS No. 91.100.15

कृपया इस मसौदे की जाँच करें और इसमें और सुधार के संबंध में अपनी सम्मतियाँ साझा करें।

**सम्मतियाँ भेजने की अंतिम तिथि: 22/10/2024**टिप्पणियाँ, यदि कोई हों, बीआईएस ई-गवर्नेंस पोर्टल [https://www.services.bis.gov.in/php/BIS\\_2.0/WCDraft/comment\\_pdraft.php](https://www.services.bis.gov.in/php/BIS_2.0/WCDraft/comment_pdraft.php) 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](mailto:ced06@bis.gov.in) या [divya.s@bis.gov.in](mailto:divya.s@bis.gov.in) पर ईमेल की जा सकती हैं।**आपको अपनी टिप्पणियाँ सबमिट करने के लिए लॉग इन करने की आवश्यकता हो सकती है, कृपया लॉग इन करने के लिए अपने मोबाइल नंबर (बीआईएस को प्रदान किया गया) और ओटीपी प्रावधान का उपयोग करें।**

यदि कोई सम्मति प्राप्त नहीं होती है अथवा सम्मति में केवल भाषा संबंधी त्रुटि हुई तो हम मान लेंगे कि प्रारंभिक मसौदे के लिए आपका अनुमोदन प्राप्त हुआ है। यदि सम्मति तकनीकी प्रकृति की हुई तो उसे विषय समिति के अध्यक्ष के परामर्श से आवश्यक कार्रवाई के लिए विषय समिति के सामने रखा जाएगा।

धन्यवाद।

भवदीय

ह/-

(दिव्या एस.)

सदस्य सचिव सीईडी 06

वैज्ञानिक 'डी'(सिविल इंजीनियरिंग)

ई-मेल: [divya.s@bis.gov.in](mailto:divya.s@bis.gov.in)**संलग्न: उपरलिखित**

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Website: [www.bis.org.in](http://www.bis.org.in) , [www.bis.gov.in](http://www.bis.gov.in)**PRELIMINARY DRAFT****Our Reference: CED 06/T-43****01 October 2024****Technical Committee: Stone Sectional Committee, CED 06****Addressed To:**

- All Members of Civil Engineering Division Council, CEDC
- All Members of CED 06
- All others interested

Dear Sir/Madam,

Please find enclosed the following document:

Doc No.	Title
CED 06 (26667)P	<b>Polished Building Stones — Specification Part 2 Marble and Similar Stones</b> [Proposed IS 14223 (Part 2)] ICS No. 91.100.15

Kindly examine the attached draft and forward your comments for further improvement.

**Last Date for comments: 22 October 2024**

Comments if any, may be sent online through the BIS e-governance portal at [https://www.services.bis.gov.in/php/BIS\\_2.0/WCDraft/comment\\_pdraft.php](https://www.services.bis.gov.in/php/BIS_2.0/WCDraft/comment_pdraft.php).

Alternatively, comments may also be recorded in the enclosed format and emailed at [ced06@bis.gov.in](mailto:ced06@bis.gov.in) or at [divya.s@bis.gov.in](mailto:divya.s@bis.gov.in).

***You may be required to login to submit your comments, kindly use your mobile number (provided to BIS) and the otp provision to login.***

In case no comments are received, or comments received are of editorial nature, kindly permit us to presume your approval for the above document. However, in case comments of technical nature are received, then in consultation with the Chairperson, CED 06 the comments may be put up to the Sectional Committee for necessary action.

Thanking you,

Sd/-

**(Divya S.)**Member Secretary CED 06  
Scientist 'D' (Civil Engineering)E-mail: [divya.s@bis.gov.in](mailto: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](https://www.services.bis.gov.in/php/BIS_2.0/WCDraft/comment_pdraft.php) shall be appreciated.**]

**Doc. No.:** CED 06(26667)P**BIS Letter Ref:** CED 06/T-43

**Title:** Polished Building Stones — Specification  
Part 2 Marble and Similar Stones  
[Proposed (IS 14223 Part 2)]

Last date of comments: **22 October 2024****Name of the Commentator/ Organization:** \_\_\_\_\_

Sl No.	Clause/ Para/ Table/ Figure No. commented	Comments/ Modified Wordings	Justification of Proposed Change
1.			
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*NOTE- Kindly insert more rows as necessary for each clause/table, etc*

*Preliminary Draft Indian Standard*

**POLISHED BUILDING STONES — SPECIFICATION  
PART 2 MARBLE AND SIMILAR STONES**

*[New Standard(Proposed IS 14223(Part 2))]*

**FOREWORD**

*(foreword will be further expanded after P-draft stage)*

Marble free from imperfections and unwanted/deleterious minerals that may interfere with the appearance, strength, structural integrity and its amenability to take good polish are more in demand. But marbles with imperfections and unwanted/deleterious minerals may also be utilized in the industry. Imperfections are mostly imparted by the textural variations which are a function of degree of uniformity and the distribution of the constituent minerals. Hair line cracks/joints, flowers, moles, knots, white and dark lines due to segregation of light coloured minerals in multi-coloured marbles and dark colour minerals in light coloured marbles are considered to be imperfections.

Nowadays with the use of technology in mining, processing (cutting, polishing and surface finishes) the marbles with imperfections such as flowers, moles, knots, white and dark lines, and other textural variations are in demand in the market. Generally, marble should be free from deleterious minerals such as pyrite, marcasite which interfere with the colour and appearance of weathering and also affect polishing characteristics. However, marble with minerals such as pyrite, marcasite biotite etc shall also quarried and processed.

This standard contributes to the United Nations Sustainable Development Goal 9 'Industry, innovation and infrastructure'; Sustainable Development Goal 11 'Sustainable Cities and Communities' towards strengthening the efforts to protect and safeguard the world's cultural and natural heritage; and Goal 12 'Ensure sustainable consumption and production patterns' towards substantial reduction of waste generation through prevention, reduction, recycling and reuse.

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*

**POLISHED BUILDING STONES — SPECIFICATION  
PART 2 MARBLE AND SIMILAR STONES**

*(New Standard)*

## **1 SCOPE**

This standard covers physical properties and finishing requirements of polished natural marble and similar stones such as ultrabasic rocks (Udaipur Green, Bidasar Green/Golden) that are commercially referred to as marble and used for various purposes.

## **2 REFERENCES**

**2.1** The Indian 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 edition of these standards.

## **3 DIMENSIONS OF SLABS**

**3.1** The stone slabs shall be rectangular or square with specified dimensions. The tolerance on length and breadth shall be  $\pm 2$  mm and on thickness  $\pm 0.1$ mm. For square slabs, the difference between length and breadth shall not exceed 2mm. The bottom face may be rough but the top surface shall be fine polished and joint faces shall be dressed with the top surface without hollowness and spalling off.

## **4 PHYSICAL PROPERTIES**

The physical properties of stone shall conform to the requirements given in Table 1.

## **5 FINISH**

The surface of the polished stone shall have mirror finish without any hairline crack. The polish on the surface shall be checked with glossmeter instrument and shall not be less than 80 GU.

## **6 MARKING**

**6.1** The stone Slabs may be marked in a suitable manner with the manufacturer's identification mark or initials.

## **6.2 BIS Certification Marking**

The product(s) may be marked with Standard Mark as per the conformity assessment schemes governed by the provisions of the Bureau of Indian Standards Act, 2016 and the Rules and Regulations made there under. The details of conditions for the license may be obtained from the Bureau of Indian Standards.

## **7 SAMPLING**

### **7.1 Lot**

In any consignment all the slabs of the same quarry shall be grouped together to constitute a lot.

**7.1.1** Samples shall be selected and tested separately for each lot for determining its conformity or otherwise to the requirements of this specification.

**7.2** The number of slabs to be selected for the sample shall depend upon the size of the lot and shall be in accordance with Table 2.

The slabs in the sample shall be selected at random in accordance with IS 4905.

**7.3** All the slabs selected in accordance with col (3) of Table 2 shall be examined for general requirements, dimensions and finish. Any slab failing in any one or more of the above requirements shall be considered as defective. A lot shall be considered as conforming to those requirements if the number of defective slabs obtained is not more than the permissible number of defectives given in col (4) of Table 2.

**7.4** The lot having been found satisfactory with respect to dimensions, general requirements and finish shall be tested for physical properties. For this purpose a sub-sample of size given in col (5) of Table 2 shall be selected at random. A lot shall be considered to have satisfied the requirements of the physical properties if none of the slabs tested for the physical requirements as per Table 1 fail in any of the tests.

**Table 1 Physical Properties of Marble**  
(Clauses 4 and 7.4)

<b>SI No.</b>	<b>Characteristic</b>	<b>Requirements</b>	<b>Test Methods, Ref to Indian Standard</b>
<b>(1)</b>	<b>(2)</b>	<b>(3)</b>	<b>(4)</b>
i.	Specific gravity	2.60 to 2.98	IS 1124
ii.	Water absorption, in percent, <i>Max</i>	0.20	IS 1124

iii.	Compressive strength, in N/mm <sup>2</sup> , <i>Min</i>	46	IS 1121 (Part 1 )
iv.	Flexural Strength, in N/mm <sup>2</sup> , <i>Min</i>	6.9	IS 1121 (Part 2 )
v.	Tensile strength, in N/mm <sup>2</sup> , <i>Min</i>	6.0	IS 1121 (Part 3 )
vi.	Shear strength in N/mm <sup>2</sup> , <i>Min</i>	7	IS 1121 (Part 4 )
vii.	Hardness, in Mohs, <i>Min</i>	3	IS 13630 (Part 13)
viii.	Hardness ( Schmidt ) No. ( <i>mention impact energy</i> ), <i>Min</i>	70	IS 12608
ix.	Resistance to wear, <i>Max</i>		IS 1706
	a) Average, in mm	6.0	
	b) Individual, in mm	7.0	

## NOTES

- 1 The requirement for compressive strength shall only be applicable in the case of slabs having a thickness of 50 mm or more.
- 2 The requirement for tensile strength shall only be applicable in the case of slabs having a thickness of 50 mm or more.
- 3 The requirement for shear strength shall only be applicable in the case of slabs having a thickness of 50 mm or more for Johnson shear tool and 30 mm or more for Dutton Punching shear device.
- 4 Flexural, tensile and shear strength may be conducted only if the stone is to be used for structural applications.
- 5 Unless otherwise mentioned in the relevant standard for the test method, the specimens shall be tested both in saturated and dry conditions. The results from both these conditions shall meet the above requirements.
- 6 In cases where all parties agree the usage of the stone shall only be limited to one of the wet or dry conditions, the tests may be carried out only in that condition.

**Table 2 Sample Size and Criteria for Conformity***(Clauses 7.2, 7.3 and 7.4)*

SI No.	Number of Slabs in the Lot	Numbers of Slabs to be Selected in Sample	Permissible Number of Defectives for Dimensions, General Requirement and Finish	Sub-sample Size in Number
(1)	(2)	(3)	(4)	(5)
i.	0 to 250	5	0	3
ii.	251 to 500	10	0	3
iii.	501 to 750	15	0	6
iv.	751 to 1000	20	1	6

**ANNEX A**  
(Clause 2)  
**LIST OF REFERRED STANDARDS**

<i>IS No.</i>	<i>Title</i>
IS 1121	Determination of strength properties of natural building stones — Methods of test:
(Part 1) : 2023	Compressive strength ( <i>third revision</i> )
(Part 3) : 2023	Indirect tensile strength ( <i>third revision</i> )
(Part 4): 2013	Shear strength ( <i>second revision</i> )
IS 1124: 1974	Methods of test for determination of water absorption, apparent specific gravity and porosity of natural building stones ( <i>first revision</i> )
IS 1706: 1972	Method for determination of resistance to wear by abrasion of natural building stones ( <i>first revision</i> )
IS 4905 : 2015/ISO 24153 : 2009	Random sampling and randomization procedures ( <i>first revision</i> )
IS 12608 : 1989	Methods of determination of hardness of rock
IS 13030 : 1991	Methods of test for laboratory determination of water content, porosity, density and related properties of rock material
IS 13630 (Part 13) : 2019	Ceramic tiles — Methods of test sampling and basis for acceptance: Part 13 Determination of scratch hardness of surface according to Mohs scale ( <i>second revision</i> )