भारतीय मानक ब्यूरो
(उपभोक्ता मामले, खाद्य एवं सार्वजनिक वितरण मंत्रालय, भारत सरकार)
BUREAU OF INDIAN STANDARDS

मानक भवन, 9, बहादुर शाह ज़फर मार्ग, नई दिल्ली – 110002
Manak Bhawan, 9, Bahadur Shah Zafar Marg, New Delhi – 110002
Phones: 23230131 / 2323375 / 23239402

व्यापक परिचालन मसौदा

हमारा संदर्भ : सीईडी 02:1/टी-26 **04 सितम्बर 2024**

तकनीकी समिति : सीमेंट और कंक्रीट अनुभागीय समिति , सीईडी 02

प्राप्तकर्ता :

1. **सिविल अभियांत्रिकी विभाग परिषद, सीईडीसी के सभी सदस्य**
2. **सीमेंट और कंक्रीट अनुभागीय समिति , सीईडी 02**
3. **सीईडी 02 की उपसमितियों और अन्य कार्यदल के सभी सदस्य**
4. **रुचि रखने वाले अन्य निकाय।**

महोदय/महोदया,

निम्नलिखित मानक का मसौदा संलग्न है:

प्रलेख संख्या	शीर्षक
सीईडी 02(26501)WC	**शीघ्र दृष्टि भवन पोर्टलैंड सीमेंट —विशिष्टि** (IS 8041 तीसरा पुनरीक्षण) का भारतीय मानक मसौदा (आई सी एस संख्या : 01.040.91)

कृपया इस मसौदे का अवलोकन करें और अपनी सम्मतियाँ यह बताते हुए भेजे कि यह मसौदा प्रकाशित हो तो इन पर अमल करने में आपको व्यवसाय अथवा कारोबार में क्या कठिनाइयां आ सकती हैं।

सम्मतियाँ भेजने की अंतिम तिथि: 31 अक्टूबर 2024

सम्मति यदि कोई हो तो कृपया अधोहस्ताक्षरी को ई-मेल द्वारा ced2@bis.gov.in पर या उपरलिखित पते पर, संलग्न फोर्मेट में भेजें। सम्मतियाँ बीआईएस ई-गवर्नेंस पोर्टल, www.manakonline.in के माध्यम से ऑनलाइन भी भेजी जा सकती हैं।

यदि कोई सम्मति प्राप्त नहीं होती है अथवा सम्मति में केवल भाषा संबंधी त्रुटि हुई तो उपरोक्त प्रालेख को यथावत अंतिम रूप दे दिया जाएगा। यदि सम्मति तकनीकी प्रकृति की हुई तो विषय समिति के अध्यक्ष के परामर्श से अथवा उनकी इच्छा पर आगे की कार्यवाही के लिए विषय समिति को भेजे जाने के बाद प्रालेख को अंतिम रूप दे दिया जाएगा।

यह प्रालेख भारतीय मानक ब्यूरो की वेबसाइट **www.bis.gov.in** पर भी उपलब्ध हैं।

धन्यवाद।

भवदीय
ह-/
द्वैपायन भद्र
वैज्ञानिक ई एवं प्रमुख
सिविल अभियांत्रिकी विभाग

संलग्न: उपरलिखित

भारतीय मानक ब्यूरो
(उपभोक्ता मामले, खाद्य एवं सार्वजनिक वितरण मंत्रालय, भारत सरकार)
BUREAU OF INDIAN STANDARDS

मानक भवन, 9, बहादुर शाह ज़फर मार्ग, नई दिल्ली – 110002
Manak Bhawan, 9, Bahadur Shah Zafar Marg, New Delhi – 110002
Phones: 23230131 / 2323375 / 23239402

WIDE CIRCULATION DRAFT

Our Reference: CED 02:1/T-26 **04 September 2024**

TECHNICAL COMMITTEE: CEMENT AND CONCRETE SECTIONAL COMMITTEE, CED 02

ADDRESSED TO:

1. All Members of Civil Engineering Division Council, CEDC
2. All Members of Cement and Concrete Sectional Committee, CED
3. All Members of Subcommittees, Panels and Working Groups under CED 02
4. All others interested.

Dear Sir/Madam,

Please find enclosed the following draft:

Doc No.	Title
CED 02(26501)WC	**Draft Indian Standard Rapid Hardening Portland Cement — Specification** (*Third Revision* of IS 8041) ICS 01.040.91

Kindly examine the attached draft 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: 31 October 2024

Comments if any, may please be made in the enclosed format and emailed at ced2@bis.gov.in or sent at the above address. Additionally, comments may be sent online through the BIS e-governance portal, www.manakonline.in.

In case no comments are received or comments received are of editorial nature, kindly permit us to presume your approval for the above document as finalized. However, in case comments, 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,
Sd/-
Dwaipayan Bhadra
Scientist 'E' & Head
Civil Engineering Department

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 e-mail to **ced2@bis.gov.in** shall be appreciated.]

Doc. No.: CED 02(26501)WC

BIS Letter Ref: CED 02:1/T-26

Title: Draft Indian Standard Rapid Hardening Portland Cement — Specification (*Third Revision of IS 8041)* ICS No. 01.040.91

Last date of comments: 31 October 2024

Name of the Commentator/ Organization: _____

Sl No.	Clause/ Para/ Table/ Figure No. commented	Type of Comment (General/ Technical/ Editorial)	Comments/ Modified Wordings	Justification of Proposed Change

NOTE- *Kindly insert more rows as necessary for each clause/table, etc*

BUREAU OF INDIAN STANDARDS

DRAFT STANDARD FOR COMMENTS ONLY

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

Draft Indian Standard

Rapid Hardening Portland Cement — Specification

(Third Revision of IS 8041)

Cement and Concrete Sectional Committee, CED 02	**Last Date for Comments: 31 October 2024**

Foreword

(*Formal clauses of the standard to be added later*)

This standard was first issued as an emergency standard in 1976 and subsequently revised in 1978 and 1990. Since publication of the second revision of this standard, large number of amendments have been issued from time to time in order to modify various requirements based on experience gained with the use of the standard and the requirements of the users and also keeping in view the raw materials and fuel available in the country for manufacture of cement. Moreover, standards which were referred to in this specification has also been revised. These amendments have been incorporated in this revision so as to make it more convenient for the users. Further, packing and marking requirements have been rationalized.

Quantity of cement packed in bags and the tolerance requirement for the quantity of cement packed in bags shall be in accordance with the relevant provisions of the *Standards of Weight and Measures (Packaged Commodities) rule,* 2011 and **B-1** (*see* Annex B). Any modification in these rules in respect of tolerance on mass of cement would apply automatically to this standard.

This standard contains **6.5, 9.2.2** and **9.2.2.3** which call for agreement between purchaser and supplier.

This standard contributes to the United Nations Sustainable Development Goal 9: 'Industry, innovation and infrastructure', particularly its target to develop quality, reliable, sustainable and resilient infrastructure and also promote inclusive and sustainable industrialization.

The composition of the Committee responsible for the formulation of this standard is given in Annex C.

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 he 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.

BUREAU OF INDIAN STANDARDS

DRAFT STANDARD FOR COMMENTS ONLY

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

Draft Indian Standard

Rapid Hardening Portland Cement — Specification

(Third Revision of IS 8041)

Cement and Concrete Sectional Committee, CED 02	**Last Date for Comments: 31 October 2024**

1 SCOPE

1.1 This standard covers the manufacture, chemical and physical requirement of rapid hardening Portland cement.

NOTE — The term ‘rapid hardening’ should not be confused with ‘quick-setting’.

2 REFERENCES

The standards given 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 editions of the standards indicated in Annex A.

3 TERMINOLOGY

For the purpose of this standard, the definitions given in IS 4845 shall apply.

4 MANUFACTURE

4.1 Rapid hardening Portland cement shall be manufactured by intimately mixing together calcareous and argillaceous and/ or other silica, alumina or iron oxide bearing materials, burning them at a clinkering temperature and grinding the resultant clinker so as to produce a cement capable of complying with this specification. No material shall be added after burning other than gypsum (natural or chemical) or water or both, and not more than one percent of air-entraining agents or other agents which have proved not to be harmful.

5 CHEMICAL REQUIREMENTS

5.1 When tested in accordance with the methods given in IS 4032, rapid hardening portland cement shall comply with the chemical requirements given in Table 1.

6 PHYSICAL REQUIREMENTS

6.1 Fineness

When tested for fineness in terms of specific surface by Blaine's air permeability method as described in IS 4031 (Part 2), the specific surface of rapid hardening Portland cement shall be not less than 325 m^2/ kg.

6.2 Soundness

6.2.1 When tested by 'Le-Chatelier' method and autoclave test described in IS 4031 (Part 3), unaerated cement shall not have an expansion of more than 10 mm and 0.8 percent respectively.

6.2.1.1 In the event of cements failing to comply with any one or both the requirements specified in **6.2.1**, further tests in respect of each failure shall be made as described in IS 4031 (Part 3) from another portion of the same sample after aeration. The aeration shall be done by spreading out the sample to a depth of 75 mm at relative humidity of 50 to 80 percent for a total period of 7 days. The expansion of cement so aerated shall be not more than 5 mm and 0.6 percent when tested by 'Le-Chatelier' method and autoclave test respectively.

6.3 Setting Time

The setting time of the cement, when tested by the Vicat apparatus method described in IS 4031 (Part 5) shall conform to the following requirements:

a) Initial setting time in minutes, not less than 30, and
b) Final setting time in minutes, not more than 600.

6.3.1 If cement exhibits false set, the ratio of final penetration measured after 5 min of completion of mixing period to the initial penetration measured exactly after 20 sec of completion of mixing period, expressed as percent, shall be less than 50 when tested by the method described in IS 4031 (Part 14). In the event of cement exhibiting false set, the initial and final setting time of cement when tested by the method described in IS 4031 (Part 5) after breaking the false set, shall conform to **6.3**.

6.4 Compressive Strength

The average compressive strength of at least three mortar cubes (area of face as 50 cm^2) composed of one part of cement and three parts of standard sand (conforming to IS 650) by mass and P/ 4 + 3.0 percent (of combined mass of cement and sand) water, and prepared, stored and tested in the manner described in IS 4031 (Part 6), shall be as follows:

a) 24 hours ± 30 minutes	Not less than 16 MPa
b) 72 ± 1 hours	Not less than 27 MPa

NOTE — 'P' is the percentage of water required to produce a paste of standard consistency.

Table 1 Chemical Requirements for Rapid Hardening Portland Cement
(*Clause* 5.1)

Sl No.	Characteristic	Requirement
(1)	(2)	(3)
i)	Ratio of percentage of lime to percentages of silica, alumina and iron oxide, when calculated by the formula: $\frac{CaO-0.7\ SO_3}{2.8SiO_2+1.2Al_2O_3+0.65Fe_2O_3}$	Not greater than 1.02 and not less than 0.66
ii)	Ratio of percentage of alumina to that of iron oxide	Not less than 0.66
iii)	Insoluble residue, percent by mass	Not more than 4 percent
iv)	Magnesia, percent by mass	Not more than 6 percent
v)	Total sulphur content calculated as sulphuric anhydride (SO_3), percent by mass	Not more than 2.5 and 3.0 when tricalcium aluminate (see Note 1) percent by mass is 5 or less and greater less and greater than 5 respectively
vi)	Total loss on ignition	Not more than 5 percent

NOTE

1 The tri-calcium aluminate content (C_3A) is calculated by the formula:

$$C_3A = 2.65\ (Al_2O_3) - 1.69(Fe_2O_3)$$

where each symbol in brackets refers to the percentage (by mass of total cement) of the oxide, excluding any contained in the insoluble residue referred at Sl No. (iii).

2 Alkali aggregate reactions have been noticed in aggregates in some parts of the country. On large and important jobs where the concrete is likely to be exposed to humid atmosphere or wetting action, it is advisable that the aggregate be tested for alkali aggregate reaction. In the case of reactive aggregates, the use of cement with alkali content below 0'6 percent expressed as sodium (Na_2O), is recommended. Where however, such cements are not available, use of Portland pozzolana cement or cement pozzolanic admixture is recommended.

3 Total chloride content in cement shall not exceed 0.05 percent by mass for cement used in prestressed concrete structures and long span reinforced concrete structures. (Method of test for determination of chloride content in cement is given in IS 12423).

4 The limit of total chloride content in cement for use in plain and other reinforced concrete structures shall be as per IS 456. Till such time, the limit may be mutually agreed to between the purchaser and the manufacturer.

6.4.1 Notwithstanding the strength requirement specified in **6.3**, the cement shall show a progressive increase strength from the strength at 24 hours.

6.5 By agreement between the purchaser and the manufacturer, transverse strength test of plastic mortar in accordance with the method described in IS 4031 (Part 8) may be specified in addition to the test specified in **6.3**. The permissible values of the transverse strength for rapid hardening Portland cement shall be mutually agreed to between the purchaser and the supplier at the time of placing order.

7 STORAGE, SAMPLING, TESTS AND REJECTION

7.1 Storage, sampling, tests and rejection of rapid hardening Portland cement shall be as laid down in IS 269 for 33 grade ordinary Portland cement.

8 MANUFACTURER'S CERTIFICATE

8.1 The manufacturer shall satisfy himself that the cement conforms to the requirements of this standard, and if requested, shall furnish a certificate to this effect to the purchaser or his representative, within ten days of despatch of the cement.

8.2 The manufacturer shall furnish a certificate, within ten days of despatch of the cement, indicating the total chloride content in percent by mass of cement.

9 PACKING

9.1 The cement shall be packed in any of the following bags:

a) Multi-wall paper sacks conforming to IS 11761,
b) HDPE/PP woven sacks conforming to IS 11652,
c) Jute synthetic union bags conforming to IS 12174, or
d) Any other approved composite bag.

Bags shall be in good condition at the time of inspection.

9.2 The net quantity of cement per bag shall be 50 kg subject to provisions and tolerances given in Annex B.

9.2.1 The net quantity of cement per bag may also be 25 kg subject to tolerances as given in **9.2.1.1** and packed in suitable bags as agreed to between the purchaser and the manufacturer.

9.2.1.1 The number of bags in a sample taken for weighment showing a minus error greater than 2 percent of the specified net quantity shall be not more than 5 percent of the bags in the sample. Also the minus error in none of such bags in the sample shall exceed 4 percent of the specified net quantity of cement in the bag. However, the net quantity of cement in a sample shall be equal to or more than 25 kg.

9.2.2 When cement is intended for export and if the purchaser so requires, packing of cement may be done in bags or in drums with net quantity of cement per bag or drum as agreed to between the purchaser and the manufacturer.

9.2.2.1 For this purpose the permission of the certifying authority shall be obtained in advance for each export order.

9.2.2.2 The words 'FOR EXPORT' and the net quantity of cement per bag/drum shall be clearly marked in indelible ink on each bag/drum.

9.2.2.3 The packing material shall be as agreed to between the manufacturer and the purchaser.

9.2.2.4 The tolerance requirements for the quantity of cement packed in bags/drum shall be as given in **9.2.1.1** except the net quantity which shall be equal to or more than the quantity in **9.2.2.**

9.3 Supplies of cement in bulk may be made by arrangement between the purchaser and the supplier (manufacturer or stockist).

NOTE - A single bag or container containing 1000 kg or more net quantity of cement shall be considered as bulk supply of cement. Supplies of cement may also be made in intermediate containers, for example, drums of 200 kg, by agreement between the purchaser and the manufacturer.

10 MARKING

10.1 Each bag or drum of cement shall be legibly and indelibly marked with the following:

a) Manufacturer's name and his registered trade-mark, if any;
b) The words 'RAPID HARDENING PORTLAND CEMENT';
c) Net quantity, in kg;
d) The words 'USE NO HOOKS' on the bags;
e) Batch/control unit number in terms of week, month and year of packing;
f) Best before date (that is, 3 months from date of packing); and
g) Address of the manufacturer.

10.2 Similar information shall be provided in the delivery advices accompanying the shipment of packed or bulk cement and on cement drums (*see* **9.3**).

10.3 BIS Certification Marking

10.3.1 The cement may also be marked with the Standard Mark.

10.3.2 The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act, 2016* and the Rules and Regulations made thereunder. The details of conditions under which a license for the use of Standard Mark may be granted to manufacturers or purchasers may be obtained from the Bureau of Indian Standards.

ANNEX A
(*Clause* 2)

LIST OF REFERED INDIAN STANDARDS

IS No.	*Title*
IS 269 : 2015	Ordinary portland cement - Specification (*sixth revision*)
IS 650 : 1991	Standard sand for testing cement - Specification (*second revision*)
IS 3535 : 1986	Methods of Sampling Hydraulic Cement (*first revision*)
IS 4031	Methods of physical tests for hydraulic cement:
Part 1:1996	Determination of fineness by dry sieving (*second revision)*
Part 2 : 1999	Determination of fineness by Blaine air permeability method (*second revision)*
Part 3 : 1988	Determination of soundness (*first revision*)
Part 4 : 1988	Determination of consistency of standard cement paste (*first revision*)
Part 5 : 1988	Determination of initial and final setting times (*first revision*)
Part 6 : 1988	Determination of compressive strength of hydraulic cement other than masonry cement (*first revision*)
Part 7 : 1988	Determination of compressive strength of masonry cement (*first revision*)
Part 8 : 1988	Determination of transverse and compressive strength of plastic mortar using prism (*first revision*)
Part 9 : 1988	Determination of heat of hydration (*first revision*)
Part 10 : 1988	Determination of drying shrinkage (*first revision*)
Part 11 : 1988	Determination of density (*first revision*)
Part 12 : 1988	Determination of air content of hydraulic cement mortar (*first revision*)
Part 13 : 1988	Measurement of water retentivity of masonry cement (*first revision*)
Part 14 : 1989	Determination of false set (*first revision*)
IS 4032:1985	Method of chemical analysis of hydraulic cement (first revision)
IS 4845 : 1958	Definitions and Terminology relating to Hydraulic Cement
IS 4905 : 2015	Random sampling and randomization procedures (First Revision)
IS 11652 : 2017	Textiles — High Density Polyethylene (HDPE)/Polypropylene (PP) Woven Sacks for Packaging of 50 kg Cement — Specification (*Third Revision*)
IS 11761 : 1997	Multi-Wall paper sacks for cement - Specification (First Revision)
IS 12089 : 1987	Specification for granulated slag for the manufacture portland slag cement
IS 12174 : 1987	Specification for jute synthetic union bags for packing cement
IS 12423 : 1988	Method for colorimetric analysis of hydraulic cement

ANNEX B

(Clause 9.2*)*

TOLERANCE REQUIREMENTS FOR THE QUANTITY OF CEMENT PACKED IN BAGS

B-1 The net quantity of cement packed in bags at the plant in a sample shall be equal to or more than 50 kg. The number of bags in a sample shall be as given below:

Batch Size	*Sample Size*
100 to 150	20
151 to 280	32
281 to 500	50
501 to 1 200	80
1 201 to 3 200	125
3 201 to over	200

The bags in a sample shall be selected at random (*see* IS 4905).

B-1.1 The number of bags in a sample showing a minus error greater than 2 percent of the specified net quantity (50 kg) shall be not more than 5 percent of the bags in the sample. Also the minus error in none of such bags in the sample shall exceed 4 percent of the specified net quantity of cement in the bag.

NOTE - The matter given in **B-1** and **B-1.1** are extracts based on *the Standards of Weights and Measures (Packaged Commodities) Rule,* 2011 to which reference shall be made for full details. Any modifications made in these Rules and other related Acts and Rules would apply automatically.

B-1.2 In case of a wagon/truck load up to 25 tonnes, the overall tolerance on net quantity of cement shall be 0 to + 0.5 percent.

ANNEX C
(*Foreword*)

(Committee composition will be added after finalization)

****