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-15 **04 सितंबर 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(26499)WC	**हाइड्रोलिक सीमेंट से संबंधित परिभाषाएँ और शब्दावली** (IS 4845 का पहला 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-15 **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 02
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(26499)WC	**Draft Indian Standard Definitions and terminology relating to hydraulic cement** (*First Revision of IS* 4845) 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(26499)WC

BIS Letter Ref: CED 02:1/T-15

Title: Draft Indian Standard Definitions and terminology relating to hydraulic cement (*First Revision* of IS 4845) 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

Definitions and Terminology Relating to Hydraulic Cement

(*First Revision of* IS 4845)

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

Foreword

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

Hydraulic cement, more commonly known as cement, is one of the most extensively used basic materials in all civil engineering constructions. Tremendous progress in the civil engineering industry and the exacting demands of engineers for high quality building materials have resulted in the development of a large variety of hydraulic cements, both for specialized and general use in civil engineering constructions. There are a number of technical terms connected with the production and use of different type of hydraulic cements, which quite often require clarifications to give precise meaning to the stipulations in the standard specification and other technical documents. This standard has been prepared with the object of defining various terms relating to hydraulic cements.

This standard was first issued in 1968 as part of series of standards on cement. In this revision the necessary changes required have been incorporated in the light of experience gained in its use and also to bring it in line with the latest development on the subject. The significant modifications made in this revision include:

In the formulation of this standard due weightage has been given to international co-ordination among the standards and practices prevailing in different countries in addition to relating it to the practices in the field in this country.

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 B.

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

Definitions and Terminology Relating to Hydraulic Cement

(*First Revision of* IS 4845)

1 SCOPE

1.1 This standard lays down the general definitions applicable to hydraulic cements, as well as the particular definitions and the denominations which pertain to each type of cement.

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

3.1 Additives — In the manufacture of Portland cement, any material, other than water or gypsum, or both, which is interground with the clinker, in an amount not to exceed one percent. The following two types of additives are recognized:

a) Processing additives designed primarily to aid the cement manufacturer in grinding or otherwise processing or handling the cement, and
b) Functional additives added primarily to modify the end properties of cement.

3.1.1 The additives should be covered by a statement of their nature completing the standard denomination of the cement.

3.2 Component Materials

3.2.1 *Granulated Blast furnace Slag* — Blast furnace slag in granulated form is used for the manufacture of hydraulic cement. Blast furnace slag is non-metallic product consisting essentially of glass containing silicates and alumina silicates of lime and other bases, which is developed simultaneously with iron in blast furnace or electric pig iron furnace. Granulated slag is obtained by further processing the molten slag by rapidly chilling or quenching it with water or steam and air.

3.2.2 *High Alumina Clinker* — Clinker consisting mainly of mono calcium aluminates and obtained by complete or partial fusion of a predetermined mixture of materials mainly containing alumina (Al_2O_3) and lime (CaO) with smaller proportions of iron oxides, silica (SiO_2) and other oxides.

3.2.3 *Principal Component Materials* — The principal materials used in the manufacture of hydraulic cement should have either hydraulic or pozzolanic properties.

3.2.3.1 *Hydraulic properties* — The ability of a material to set and harden in the presence of water with formation of stable compounds.

3.2.3.2 *Pozzolanic properties* — The ability of a material to combine chemically with calcium hydroxide in the presence of water under ambient temperature forming compounds having cementitious properties.

3.2.4 *Portland Clinker* — Clinker, consisting mostly of calcium silicates, obtained by heating to incipient fusion a predetermined and homogeneous mixture of materials principally containing lime (CaO) and silica (SiO_2) with a smaller proportion of alumina (Al_2O_3) and iron oxide (Fe_2O_3).

3.2.5 *Pozzolana* — An essentially silicious material which while in itself possessing little or no cementitious properties will, in finely divided form and in the presence of water, react with calcium hydroxide at ambient temperature to form compounds possessing cementitious properties. The term includes natural volcanic material having pozzolanic properties as also other natural and artificial materials, such as diatomaceous earth, calcined clay and fly ash.

3.3 Composite Cement — Cement produced by intimately intergrinding mixing of Portland cement clinker, granulated slag and fly ash with addition of gypsum (natural or chemical) or an intimate and uniform blending of ordinary Portland cement, finely ground granulated slag and fine fly ash in the required proportion as per IS 16415 with addition of ground gypsum, if required. Its standard denomination is ‘Composite Cement’.

3.4 High Alumina Cement — The cement obtained by grinding high alumina clinker. Its standard denomination is ‘High Alumina Cement’.

3.5 Hydraulic cement — Finely ground material which on addition in requisite quantity of water is capable of hardening both under water and in air by the chemical interaction of its constituents with water, and is also capable of bending together appropriate materials.

3.6 Hydrophobic Cement — Cement obtained by grinding ordinary Portland cement clinker with an additive which will impart to ground cement, a water repelling property which shall be destroyed only by wet attrition, such as in concrete mixer. The

hydrophobic quality of cement would facilitate its storage for longer periods in extremely wet climatic conditions.

3.7 Masonry Cement — Product obtained by intergrinding a mixture of Portland cement clinker with inert materials (non-pozzolanic), such as limestone, conglomerates, dolomitic limestone and dolomite; and gypsum and an entraining plasticiser, in suitable proportions so that the resulting product conforms to the requirements laid down in IS 3466. It is characterized by certain physical properties, such as slow-hardening, high workability and high water retentivity which make it especially suitable for masonry work. Its standard denomination is **'**Masonry Cement'.

3.8 Microfine Ordinary Portland Cement — Ground and classified Portland cement meeting the specified particle size distribution and other requirements as per IS 16993.

3.9 Oil well cement — Hydraulic cement suitable for use in high pressure and temperature in sealing water and gas pockets and setting casings during the drilling and repair of oil-wells, often contains retarders to meet the requirements of such use in addition to coarser grinding and/or reduced tricalcium aluminate (C_3A) content of clinker.

3.10 Portland Calcined Clay Limestone Cement — Cement produced by intimately intergrinding mixture of Portland cement clinker, calcined clay and limestone with addition of gypsum or an intimate and uniform blending of ordinary Portland cement, finely ground limestone and fine calcined clay in the required proportion as per IS 18189 with addition of ground gypsum, if required.

3.11 Portland Cement — The cement obtained by grinding Portland clinker with the possible addition of a small quantity of gypsum, water or both, and not more than one percent of air entraining agents or other agents which have proved not to be harmful (*see* IS 269). Standard Denomination Portland Cements are Ordinary Portland Cement (*see* IS 269), Rapid Hardening Portland Cement (*see* IS 8041), Low-heat Portland Cement (*see* IS 12600) and White Portland Cement (*see* IS 8042).

3.12 Portland Pozzolana Cement (PPC) — An intimately interground mixture of Portland clinker and pozzolana with the possible addition of gypsum or an intimate and uniform blend of Portland cement and fine pozzolana, the pozzolana constituent being within limits specified in IS 1489. Its standard denomination is 'Portland Pozzolana Cement'.

3.13 Portland Slag Cement (PSC) — An intimately interground mixture of Portland clinker and granulated blast furnace slag with addition of gypsum and permitted additives (*see* **3.1**) or an intimate and uniform blend of Portland cement and finely ground granulated blast furnace slag (*see* IS 455). Its standard denomination is 'Portland Slag Cement'.

3.14 Sulphate-Resistant Portland Cement — Portland cement with its tricalcium aluminate (C_3A) content [calculated by the formula $C_3A = 2.65 (Al_2O_3) - 1.69 (Fe_2O_3)$] not more than 5 percent and specific surface determined by Blaines air permeability method not less than 2 500 cm^2/g.

3.15 Supersulphated Cement — A hydraulic cement having sulphuric anhydride (SO_3) content not more than 5 percent and made by intergrinding a mixture of at least 70 percent granulated blast furnace slag, calcium sulphate and a small amount of lime or Portland clinker. Its standard denomination is 'Supersulphated Cement'.

ANNEX A

(*Clause* 2)

LIST OF REFERRED INDIAN STANDARDS

IS No.	*Title*
IS 269 : 2015	Ordinary portland cement — Specification (*sixth revision*)
IS 455 : 2015	Portland slag cement - Specification (*fifth revision*)
IS 1489	Portland pozzolana cement — specification
Part 1 : 2015	Fly ash based (*fourth revision*)
Part 2 : 2015	Calcined clay based (*fourth revision*)
IS 3466 : 1988	Specification For Masonry Cement (*Second Revision*)
IS 6452 : 1989	Specification for high alumina cement for structural use (*first revision*)
IS 6909 : 1990	Specification for supersulphated cement (*first revision*)
IS 8041 : 1990	Specification for rapid hardening Portland cement (*second revision*)
IS 8042 : 2015	White Portland cement — Specification (*third revision*)
IS 8043 : 1991	Specification for hydrophobic Portland cement
IS 8229 : 1986	Specification for Oil-well Cement
IS 12330 : 1988	Specification for sulphate resisting Portland cement
IS 12600 : 1989	Specification for low heat Portland cement
IS 16415 : 2015	Composite cement — Specification
IS 16993 : 2018	Microfine ordinary Portland cement — Specification
IS 18189 : 2023	Portland calcined clay limestone cement – Specification

ANNEX B

(*Foreword*)

(Committee composition will be added after finalization)

****