भारतीय मानक ब्यूरो

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

BUREAU OF INDIAN STANDARDS

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व्यापक परिचालन मसौदा

हमारा संदर्भ : सीईडी 02:1/टी-52 **22 जुलाई 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(26195)WC	**पोज़ोलाना से संबंधित शब्दों की शब्दावली का भारतीय मानक मसौदा** (IS 4305 का पहला पुनरीक्षण) (आई सी एस संख्या : 91.100.30)

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: 20 सितम्बर 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

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WIDE CIRCULATION DRAFT

Our Reference: CED 02:1/T-52 **22 July 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 and its Subcommittees
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(26195)WC	**Draft Indian Standard Glossary of terms relating to pozzolana** (First Revision of IS 4305) ICS 91.100.30

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: 20 September 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(26195)WC

BIS Letter Ref: CED 02:1/T-52

Title: Draft Indian Standard Glossary of terms relating to pozzolana (First Revision of IS 4305) ICS No. 91.100.30

Last date of comments: 20 September 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

Draft Indian Standard

Glossary of terms relating to pozzolana

(*First Revision of IS 4305*)

Cement and Concrete Sectional Committee, CED 02	**Last Date for Comments: 20 September 2024**

Foreword

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

Pozzolanas find extensive application in this country in the preparation of structural mortar and concrete. Their use is likely to increase further with the availability of industrial wastes and other artificial pozzolanic materials as a result of further industrialization in the country. This has necessitated formulation of a number of Indian Standard specifications and methods of tests for different types of pozzolanas. These standards include a number of technical terms which quite often require clarifications to give precise meaning to the stipulations in the standards. This glossary has been prepared to clarify various terms relating to various types of pozzolanic materials.

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 is one of a series of Indian Standards on pozzolanas. Other standards published so far in the series are:

IS 1344 : 1981 Specification for calcined clay pozzolana (*second revision*)

IS 1727 : 1967 Methods of test for pozzolanic materials (*first revision*)

IS 3812 (Part 1) : 2013 Pulverized fuel ash – Specifications Part 1 For use as pozzolana in cement, cement mortar and concrete (*third revision*)

IS 3812 (Part 2) : 2013 Pulverized fuel ash – Specifications Part 2 For use as admixture in cement mortar and concrete (*third revision*)

IS 4098 : 1983 Specification for lime-pozzolana mixture (*first revision*)

This standard was first published in 1967. In this revision the necessary changes as well as additional definitions required have been incorporated in the light of experience gained in its use, to bring it in line with the latest development on the subject and also other standards referred to in the specification which had been revised.

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.

BUREAU OF INDIAN STANDARDS

DRAFT STANDARD FOR COMMENTS ONLY

Draft Indian Standard

Glossary of terms relating to pozzolana

(*First Revision of IS 4305*)

1 SCOPE

This standard covers definitions of words and terms relating to pozzolanas.

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 Andesite — A volcanic rock, belonging to the intermediate group (consisting of 55 percent to 66 percent silica) composed essentially of a plagioclase feldspar, with a pyroxene, hornblende or biotite and more of less of a glassy base.

3.2 Artificial Pozzolana — Industrial by-products used as pozzolana like fly ash, burnt oil shale, ground burnt clay, silica fumes, etc.

3.3 Bottom Ash — Pulverized fuel ash collected from the bottom of boilers by any suitable process.

3.4 Burnt Clay Fine Aggregate — An artificial pozzolanic aggregate obtained by burning and grinding clay to particle size not exceeding 4.75 mm.

3.5 Burnt Clay Pozzolana — An artificial pozzolana obtained by burning clay under specified conditions and grinding to a specified degree of fineness (*see* IS 1344).

3.6 Calcareous Pulverized Fly Ash — Fly ash conforming to the provisions of calcareous fly ash given in IS 3812 (Part 2) and having reactive calcium oxide not less than 10 percent by mass. Such fly ash is normally produced from burning lignite or sub-bituminous coal and has both pozzolanic and hydraulic properties.

3.7 Calcined Pozzolana — Materials that are produced by calcination of natural siliceous or alumina-siliceous earths, such calcination being for the purpose of activation of pozzolanic properties.

3.8 Chert — A compact, siliceous rock formed of chalcedonic or opaline silica, one or both, and of organic or precipitated origin.

3.9 Cinder or Coal Ash — Well-burnt furnace residues which have been fused or sintered into lumps of varying sizes. The same material in powder form is found to possess some pozzolanic activity.

3.10 Clays and Shales Pozzolanas — Pozzolanas, such as kaolinite type, montmorillonite type, which have to be calcined to activity.

3.11 Diatomaceous Earth

a) Deposit of fine, generally white, siliceous powder, composed chiefly or wholly of the remains of diatoms. The term diatom applies to a group of microscopic unicellular marine or freshwater algae characterized by silicified cell walls.
b) Siliceous earth of organic origin.

3.12 Fly Ash — A finely divided residue that results from the combustion of ground or pulverized coal and is transported from boilers by flue gases and collected by cyclone separation or electrostatic precipitation (*see* IS 3812).

3.13 Lime Pozzolana Concrete — Concrete having lime pozzolana mixture as the binder.

3.14 Lime Pozzolana Mixture — A ready made mixture of lime and a pozzolana in a specified proportion (*see* IS 4098).

3.15 Lime Pozzolana Mortar — A mixture of lime, pozzolana and water with or without additions of fine aggregate.

3.16 Lime Reactivity— An index of pozzolanic activity of a material based on compressive strength tests on lime pozzolana mortar cubes (for test *see* IS 1727) and expressed in terms of kilogram per square centimetre.

3.17 Mound Ash — Fly ash or bottom ash or both mixed in any proportion and conveyed or carried in dry form and deposited dry.

3.18 Natural Pozzolana — Materials that in the natural state, exhibit pozzolanic properties, such as volcanic ashes and tuffs, clays and shales and diatomaceous earth.

3.19 Olivine — An important, rock forming mineral, ‘composed mainly of magnesium and ferrous orthosilicates, crystallizing in the orthorhombic system and occurring as a common constituent of many basic and ultrabasic igneous rocks.

3.20 Opaline Material Pozzolanas — Pozzolanas, such as diatomaceous earth opaline chert and shales, which may or may not require calcination.

3.21 Phonolite or Clink-Stone — Fine-grained, compact, alkaline-lava rock rich in nepheline and sanidine, with subordinate sodic-amphibole and sodic-pyroxene and giving out a ringing sound when struck with a hammer, hence the name clink-stone.

3.22 Plagioclase —The term refers to the important rock-making minerals lime-soda felspars, which form a complete solid-solution series from pure albite ($NaAl\ Si_3O_8$) to pure anorthite ($CaAlSi_3O_8$) all of which crystallize in the triclinic system.

3.23 Pond Ash — Fly ash or bottom ash or both mixed in any proportion and conveyed in the form of water slurry and deposited in pond or lagoon.

3.24 Portland-Pozzolana Cement — An intimately interground mixture of Portland cement clinker/ordinary Portland cement and pozzolana with the possible addition of gypsum (natural or chemical) or an intimate and uniform blending of ordinary portland cement and fine pozzolana, with addition of ground gypsum, if required (*see* IS 1489).

3.25 Pozzolana — An essentially silicious material which while in itself possessing no cementitious properties will, in finely divided form and in the presence of water, react with calcium hydroxide at ordinary temperature to form compounds possessing cementitious properties.

3.26 Pozzolana Mortar — A lime or cement mortar in which pozzolana has been used.

3.27 Pozzolanic Cement Concrete — Concrete having pozzolana partly substituted for its cement, the pozzolana content being not less than 10 percent of the combined weight of cement plus pozzolana.

3.28 Pozzolanic Material — Materials which have the pozzolanic activity of combining with lime to form cementitious compounds.

3.29 Pulverized Fuel Ash — Ash generated by burning of ground or pulverized or crushed coal or lignite fired boilers. It can be fly ash, bottom ash, pond ash or mound ash.

3.30 Pumice — Naturally occurring very fine material, pumacious, volcanic ash usually rhyolitic in composition, used as pozzolana.

3.31 Rhyolite — A wholly crystalline, partly glassy or entirely glassy volcanic equivalent of granite, differing from the latter in the paucity of hydrous mineral muscovite and presence of high temperature alkali felspar sanidine.

3.32 Siliceous Fly Ash — Fly ash conforming to the provisions of siliceous fly ash given in this standard and having reactive calcium oxide less than 10 percent, by mass. Such fly ash is normally produced from burning anthracite or bituminous coal and has pozzolanic properties.

3.33 Shale — A fine-grained, earthy sedimentary rock that is a somewhat indurated clay and is characterized by a thinly layered laminated structure, by which it is differentiated from clay. It is usually harder than clay and has less tendency to slake in water.

3.34 *Surkhi* — The coarse powder obtained by pounding of bricks and used as an aggregate as well as a pozzolanic material. It is obtained as a by-product of the brick industry.

3.35 Trass — Finely ground tufa stone deriving from volcanic eruptions.

3.36 Volcanic Ash — A natural pozzolana, which is one of the solid products of a volcanic eruption consisting of tiny particles, of size ranging from a fraction of a millimetre to several millimetres, of a mineral mass, formed by the crushing of the rock of which the central conduit walls of the volcano are made of.

3.37 Volcanic Sand — One of the solid products of a volcanic eruption consisting of particles, of the size of sand grains, of a mineral mass, formed by the crushing of the rock of which the central conduit walls of the volcanoes are made of. It is a natural pozzolana when ground to finer particles.

3.38 Volcanic Tuff — A solidified rock of volcanic ash and volcanic sand brought down the slopes of a volcano by rain, compacted under its own weight and by the action of water. It is a natural pozzolana when powdered.

ANNEX A
LIST OF REFERRED INDIAN STANDARDS

IS No.	*Title*
IS 1344 : 1981	Specification for calcined clay pozzolana (*second revision*)
IS 1489	Portland pozzolana cement — Specification
Part 1 : 2015	Fly ash based (*fourth revision*)
Part 2 : 2015	Calcined clay based (*fourth revision*)
IS 1727 : 1967	Methods of test for pozzolanic materials (*first revision*)
IS 3812	Pulverized fuel ash — Specification:
Part 1 : 2013	For use as pozzolana in cement, cement mortar and concrete (*third revision*)
Part 2 : 2013	For use as admixture in cement mortar and concrete (*third revision*)
IS 4098 : 1983	Specification for lime - pozzolana mixture (*first revision*)

ANNEX B

(Committee composition will be added after finalization)

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