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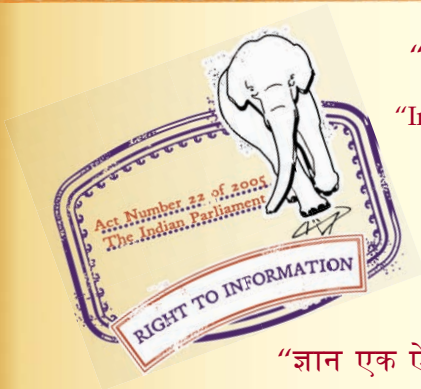
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IS 4305 (1967): Glossary of terms relating to Pozzolana  
[CED 2: Cement and Concrete]



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“Invent a New India Using Knowledge”



“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”



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*Indian Standard*  
GLOSSARY OF TERMS  
RELATING TO POZZOLANA  
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# Indian Standard

## GLOSSARY OF TERMS RELATING TO POZZOLANA

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( Continued on page 2 )

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# *Indian Standard*

## GLOSSARY OF TERMS RELATING TO POZZOLANA

### 0. FOREWORD

**0.1** This Indian Standard was adopted by the Indian Standards Institution on 20 October 1967, after the draft finalized by the Pozzolanas Sectional Committee had been approved by the Civil Engineering Division Council.

**0.2** 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.

**0.3** 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.

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

IS : 1344-1959 Specification for *SURKHI* for use in mortar and concrete\*

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

IS : 3812 ( Part I )-1966 Specification for fly ash: Part I For use as pozzolana

IS : 3812 ( Part II )-1966 Specification for fly ash: Part II For use as admixture for concrete

IS : 3812 ( Part III )-1966 Specification for fly ash: Part III For use as fine aggregate for mortar and concrete

IS : 4098-1967 Specification for lime-pozzolana mixture

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\*Under revision.

## 1. SCOPE

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

## 2. TERMINOLOGY

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

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

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

2.4 **Burnt Clay Pozzolana** — An artificial pozzolana obtained by burning clay under specified conditions and grinding to a specified degree of fineness ( see IS : 1344-1959\* ).

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

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

2.7 **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.

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

### 2.9 Diatomaceous Earth

a) 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 fresh-water algae characterized by silicified cell walls.

b) Siliceous earth of organic origin.

2.10 **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 : 3812-1966† )

\*Specification for *SURKHI* for use in mortar and concrete ( *under revision* ).

†Specification for fly ash.



- 2.11 Lime Pozzolana Concrete** — Concrete having lime pozzolana mixture as the binder.
- 2.12 Lime Pozzolana Mixture** — A ready made mixture of lime and a pozzolana in a specified proportion ( *see* IS : 4098-1967\* ).
- 2.13 Lime Pozzolana Mortar** — A mixture of lime, pozzolana and water with or without additions of fine aggregate.
- 2.14 Lime Reactivity** — An index of pozzolanic activity of a material based on compressive strength tests on lime pozzolana mortar cubes ( for test *see* IS : 1727-1967† ) and expressed in terms of kilogram per square centimetre.
- 2.15 Natural Pozzolana** — Materials that in the natural state, exhibit pozzolanic properties, such as volcanic ashes and tuffs, clays and shales and diatomaceous earth.
- 2.16 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.
- 2.17 Opaline Material Pozzolanas** — Pozzolanas, such as diatomaceous earth opaline chert and shales, which may or may not require calcination.
- 2.18 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.
- 2.19 Plagioclase** — The term refers to the important rock-making minerals lime-soda feldspars, which form a complete solid-solution series from pure albite (  $\text{NaAl Si}_3\text{O}_8$  ) to pure anorthite (  $\text{Ca Al Si}_3\text{O}_8$  ) all of which crystallize in the triclinic system.
- 2.20 Portland-Pozzolana Cement** — An intimately interground mixture of Portland cement clinker and pozzolana with possible addition of calcium sulphate of an intimate and uniform blend of Portland cement and fine pozzolana, the pozzolana constituent being neither less than 10 percent nor more than 25 percent by weight of the Portland-pozzolana cement ( *see* IS : 1489-1962‡ ).
- 2.21 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.

\*Specification for lime pozzolana mixture.

†Methods of test for pozzolanic materials ( *first revision* ).

‡Specification for Portland-pozzolana cement ( *under revision* ).

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

**2.23 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.

**2.24 Pozzolanic Material** — These materials which have the pozzolanic activity of combining with lime to form cementitious compounds.

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

**2.26 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.

**2.27 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.

**2.28 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.

**2.29 Trass** — Finely ground tufastone deriving from volcanic eruptions.

**2.30 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.

**2.31 Volcanic Sand** — It is 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.

**2.32 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.