

Indian Standard

**CALCINED CLAY POZZOLANA — METHODS
OF SAMPLING**

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

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Price Group 2

FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards on 25 October 1989, after the draft finalized by the Building Materials and Components Sampling Sectional Committee had been approved by the Basic Standards, Systems and Services Division Council.

It is imperative that proper quality is maintained for the ingredients used in the production of mortar and concrete—calcined clay pozzolana can be used for manufacture of portland pozzolana cement; for blending with hydrated lime to produce lime pozzolana mixture; and for partial replacement of ordinary portland cement as an admixture in the production of mortar and concrete.

Sampling inspection of calcined clay pozzolana, so as to determine its quality may be done by the purchaser or his authorized representative or by any person appointed to superintend the works.

ONLY

*Indian Standard***CALCINED CLAY POZZOLANA — METHODS OF SAMPLING****1 SCOPE**

1.1 This standard prescribes the methods of sampling and criteria for conformity of calcined clay pozzolana.

2 REFERENCES

2.1 The following Indian Standards are necessary adjuncts to this standard:

<i>IS No.</i>	<i>Title</i>
IS 1344 : 1981	Specification for calcined clay pozzolana
IS 4905 : 1961	Methods for random sampling

3 TERMINOLOGY

3.0 For the purpose of this standard, the following definitions shall apply.

3.1 Lot

The quantity of calcined clay pozzolana of the same grade, from the same manufacturing unit and offered for inspection at one time, not exceeding 500 t.

3.2 Sub-lot

The quantity of calcined clay pozzolana in each of the parts into which a lot is divided for the purpose of sampling.

3.3 Increment

The quantity of material taken at a time by the sampling implement.

3.4 Gross Sample

Sample as collected from a sub-lot, that is the quantity of material obtained by aggregating together all the increments from the same sub-lot.

3.5 Laboratory Sample

The quantity of material obtained by reducing the gross sample by following a specified procedure for laboratory testing.

3.6 Composite Sample

The quantity of material obtained by mixing together equal quantities of material from each of the laboratory samples representing the sub-lots into which the lot has been divided.

4 GENERAL REQUIREMENTS OF SAMPLING

4.1 In drawing, preparing, storing and handling samples the following test precautions and directions shall be observed:

- a) The sampling implement shall be clean and dry when used.
- b) Precautions shall be taken to protect the sample, the material being sampled, the sampling implement and the containers/bags for samples from adventitious contamination.
- c) The sample containers/bags shall be sealed after filling and marked with full particulars of the material and the date of sampling.
- d) The place of sampling shall be clean and dry and free from draught.

4.2 The interval of drawing the increments shall be, as far as possible, uniform in terms of mass throughout the whole quantity of the lot. However, if the rate of handling quantity is uniform, the interval of drawing the increments may be based on time unit in place of quantity unit.

5 LOT INSPECTION

5.1 For ascertaining the conformity of the material in the lot to the requirements given in the product specification, samples shall be tested from each lot separately.

5.2 Sampling in Loose Form

5.2.1 A composite sample for testing shall be prepared by mixing approximately equal portions selected from at least 12 different positions in the heap.

5.2.2 The composite sample shall be tested for all the requirements given in the material specification.

5.2.3 The material in the heap shall be declared as conforming to the requirements given in the relevant material specification if all the test results on the composite sample meet the corresponding specification requirements.

5.3 Sampling from Conveyors During Loading or Unloading

5.3.1 In case material is in the powder form for the purpose of sampling a lot while it is being loaded or unloaded shall be divided into a number of sub-lots in accordance with col 1 and 2 of Table 1.

Table 1 Number of Sub-lot/Increments* into which A Lot is to be Divided

(Clause 5.3.1)

Weight of the Lot (tonnes)	Number of Sub-lots	Number of Increments for Material in Lumps
(1)	(2)	(3)
Up to 15	1	2
16 to 50	2	4
51 to 100	3	6
101 to 300	4	8
301 to 500	5	10

*For material in lumps.

5.3.1.1 A representative gross sample shall be taken from each of sub-lots and shall be kept separately. Thus, there will be as many gross samples as the number of sub-lots into which the lot has been divided.

5.3.1.2 The gross sample shall be collected by taking number of increments at regular intervals such that at least one increment is taken for every 10 t or part thereof from the material in the sub-lot. The increments may be collected with help of a suitable slotted tube sampler (see Fig. 1).

5.3.2 In case the material is in lumps form, the number of increments to be taken from the lot shall be in accordance with col 1 and col 3 of Table 1. The increments may be collected with the help of a suitable sampling scoop (see Fig. 2).

5.3.3 The weight of the increment shall not be less than 500 grams in case the material is in powder form and 2 kg in case the material is in lumps form. It shall be ensured that the quantity of sample so collected is sufficient for carrying out various tests.

5.4 Sampling from Trucks During Loading or Unloading

5.4.1 For the purpose of sampling, all the trucks in a lot shall be divided into a suitable number

of sub-lots of approximately equal weight in accordance with Table 1. A representative gross sample shall be drawn from each of the sub-lots. The quantity of material in the gross sample shall be sufficient to carry out various tests.

5.4.2 As increments are taken from the sub-lot they shall be placed directly in moisture proof containers/bags to avoid moisture absorption of the sample. Moisture proof multiple wall paper bags or plastic bags may be used, if they are strong enough to avoid breakage. The containers shall carry suitable identification marks so that they can be related back to the particular sub-lot from which the gross sample has been taken.

5.5 Sampling from Bags

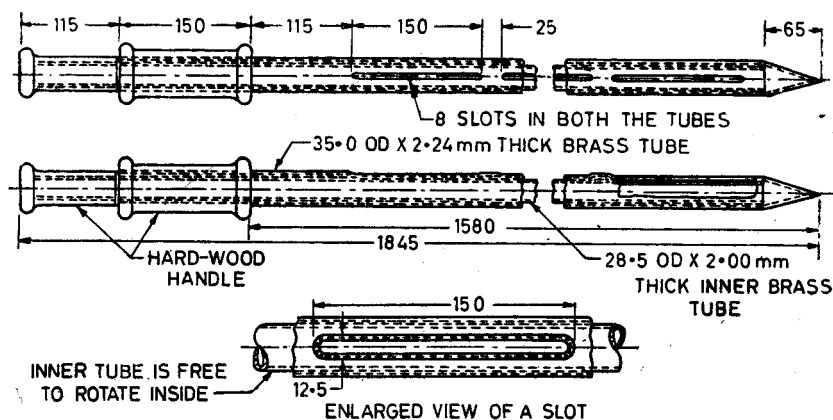
5.5.1 For the purpose of sampling, the quantity of material in the lot shall be divided into a number of sub-lots depending upon the weight of the lot in accordance with Table 1. The sub-lots shall consist of approximately equal number of bags.

5.5.2 For drawing representative sample from a sub-lot, at least 2 percent of the bags subject to a minimum of 3 bags shall be sampled. In case fractional numbers are obtained, the number of bags shall be equal to the next higher integer.

5.5.2.1 These bags shall be chosen at random from the sub-lot. In order to ensure the randomness of selection, methods prescribed in IS 4905 : 1968 may be followed.

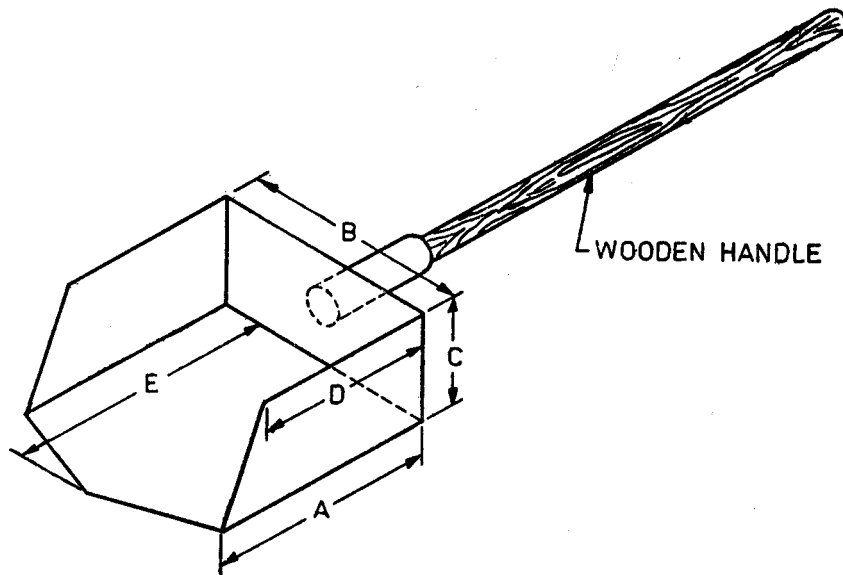
Example:

Suppose 60 tonnes of pozzolana consisting of 1 200 bags each of 50 kg are submitted for inspection, then according to col 1 and 2 of Table 1, the lot shall be sub-divided into 3 sub-lots each of 400 bags. From each sub-lot, 2 percent of the bags, that is 8 bags shall be selected at random.



All dimensions in millimetres.

FIG. 1 SLOTTED TUBE-SAMPLER FOR BULK MATERIAL



Capacity of Scoop (kg)	Dimensions of the Scoop in mm				
	A	B	C	D	E
10	250	250	120	200	300
5	200	200	90	175	240
2	150	150	75	125	180

FIG. 2 SAMPLING SCOOP

5.5.2.2 The sampling tube shown in Fig. 3 shall be inserted diagonally into the valve of the bag and thumb is placed over the air hole and then shall be withdrawn. The material may be drawn in two or three operations.

5.5.2.3 From each selected bag approximately equal number of increments shall be taken and weight of each increment shall be at least 500 g. It shall be ensured that the quantity of sample so collected is sufficient for carrying out various tests in triplicate.

5.6 Reduction of Gross Sample

5.6.1 In case of lumps, the gross sample shall be crushed to the size of 5 mm approximately.

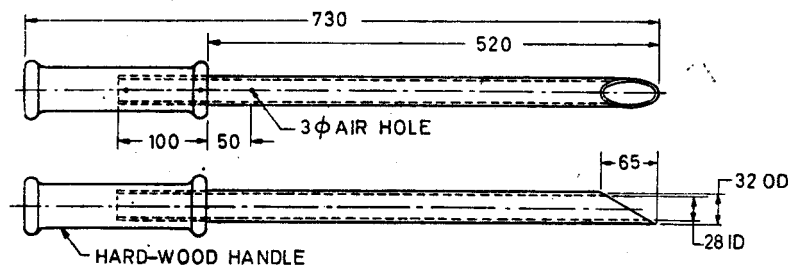
5.6.2 Each gross sample shall be reduced separately. It may be reduced by coning and quartering till a quantity of material sufficient for

carrying out various tests is obtained. The gross sample so reduced shall constitute the laboratory sample.

5.6.3 Coning and Quartering

Calcined clay pozzolana shall be heaped into the shape of a cone by pouring one scoopful of the material after another at the apex of the cone till entire sample has been coned. The material shall be allowed to slide down the sides of the cone only under the influence of the gravity. Flatten the cone evenly so that it forms a low circular pile. Cut the pile into four quarters alongwith two diameters which intersect at right angles. Retain one pair of opposite quarters and reject the other. Repeat till size of retainer sample is reduced to the required weight.

5.6.3.1 Sample splitter or riffle samples of the appropriate size may be used for reducing the gross sample mechanically.



All dimensions in millimetres.

FIG. 3 TUBE SAMPLER

5.6.4 The reduction of the gross sample in the manner described in 5.6.2 shall be continued till the quantity of material required for the laboratory sample is obtained.

5.6.5 Equal quantities of material shall be taken from each of the laboratory samples representing various sub-lots and mixed together to constitute a composite sample of requisite quantity, representing a lot.

5.6.6 The laboratory sample and the composite sample shall be divided into three equal parts, one for the purchaser, another for the supplier and the third to be used as a referee sample. The referee sample shall be used in the case of a dispute between the purchaser and the supplier. Each of these parts shall then be placed in a moisture proof container/bag to avoid moisture absorption. They shall be labelled with full identification particulars such as supplier's name, the lot and sub-lot number, wherever applicable, date of sampling, etc.

5.7 Number of Tests

5.7.1 In case the material is in the powder form fineness shall be tested on each of the laboratory samples.

5.7.2 A composite sample shall be tested after grinding the material to necessary fineness for all requirements as prescribed in IS 1344 : 1981.

5.8 Criteria for Conformity

5.8.1 For those characteristics where a compo-

site sample has been tested for a lot, only one test result will be available and that result shall satisfy the requirements of the specification.

5.8.2 When two laboratory samples have been analysed individually for fineness (see 5.7.1) from a lot, the lot shall be deemed to be conforming to this requirement, only if both of them pass.

5.8.3 When three or more laboratory samples have been analysed individually for fineness (see 5.7.1) from a lot, the following procedure shall be followed for judging the conformity of the lot to this requirement.

5.8.3.1 For the different test results obtained by analysing different laboratory samples, the average (\bar{X}) and the range (R) shall be calculated as follows:

$$\text{Average } (\bar{X}) = \frac{\text{The sum of test results}}{\text{Number of test results}}$$

$$\text{Range } (R) = \text{The difference between the maximum and the minimum values of the test results}$$

5.8.3.2 The value of the expression ($\bar{X} - 0.5R$) shall be calculated from the relevant test results. If the value so obtained is greater than or equal to the minimum specification limit, the lot shall be declared as conforming to this requirement.

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BUREAU OF INDIAN STANDARDS

Headquarters :

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002
Telephones : 331 01 31, 331 13 75

Telegrams : Manaksanstha
(Common to all Offices)

Regional Offices :

	Telephone
Central : Manak Bhavan, 9 Bahadur Shah Zafar Marg, NEW DELHI 110002	{ 331 01 31 331 13 75
Eastern : 1/14 C. I. T. Scheme VII M, V. I. P. Road, Maniktola CALCUTTA 700054	37 86 62
Northern : SCO 445-446, Sector 35-C, CHANDIGARH 160036	2 18 43
Southern : C. I. T. Campus, IV Cross Road, MADRAS 600113	41 29 16
Western : Manakalaya, E9 MIDC, Marol, Andheri (East) BOMBAY 400093	6 32 92 95

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