

May 2005

**SCHEME OF TESTING AND INSPECTION  
FOR CERTIFICATION OF  
PORTLAND POZZOLANA CEMENT according to  
IS1489 (Part 1):1991 (Including Amendment No.1 to 4)  
IS1489 (Part 2):1991 (Including Amendment No. 1 to 3)  
(Part 1) - Fly Ash Based  
(Part 2) - Calcined Clay Based**

**(For Large Scale Cement Plant having Capacity above 600 tpd)**

1. **LABORATORY** – A laboratory shall be maintained which shall be suitably equipped and staffed where different tests given in the specification shall be carried out in accordance with the methods given in the specification.
2. **TEST RECORDS** - All records of tests, inspection and calibration shall be kept in suitable forms approved by the Bureau.
  - 2.1 All testing apparatus/measuring instruments shall be periodically checked and calibrated and records of such checks/calibration shall be maintained.
  - 2.2 Copies of any records and other connected papers that may be required by the Bureau shall be made available at any time on request.
3. **QUALITY CONTROL** – It is recommended that, as far as possible, Statistical Quality Control (SQC) methods may be used for controlling the quality of the product during production as envisaged in this Scheme [See IS 397(Part I)-2003, IS 397(Part 2)-2003 and IS 397(Part 3)-2003].
  - 3.1 In addition, effort should be made to gradually introduce a Quality Management System in accordance with IS/ISO 9000 series as appropriate to the activities of the organization.
  - 4.0 **CALIBRTION** – Periodic calibration of various testing equipments shall be carried out and records of such calibrations kept. The following equipments shall be calibrated at a frequency shown against each and records kept.

**TEST EQUIPMENT**

**FREQUENCY OF CALIBRATION**

- |  |   |
|--|---|
| i) Blaine's apparatus                    | Daily with licensee's own Standard cement sample and once in a month with standard cement samples supplied by NCCBM.  |
| ii) Compressive strength Testing machine | Once in a month with licensee's own proving ring and the proving ring shall be calibrated once in two years from the recognized calibrating agency like NPL/NABL accredited Lab or proving ring manufacturer having NPL certified calibrator. |

**DOC: STI/1489(Part-1)& (Part-2)/1/LS  
May 2005**

- |      |  |  |
|------|--|--|
| iii) | Autoclave pressure gauge                     | Once in a six months either by licensee's own dead weight Pressure gauge or from approved independent agency /NABL accredited Lab or manufacturer of such gauge having NPL certified calibrator. |
| iv)  | Vibration machine                            | Once in a month by licensee's own tachometer. The tachometer shall be Calibrated once in three Years from approved out Side agency /NABL accredited Lab having NPL certified calibrator..        |
| v)   | Dead wt pressure gauge Tester (if available) | Once in four years from NABL accredited Lab or OEM (Original Equipment manufacturer) having NPL certified calibrator.  |

5. **STANDARD MARK** – The Standard Mark, as given in Column (1) of the First Schedule of the licence, shall be printed or stencilled on each bag or package of Portland Pozzolana Cement or on the label applied to it, provided always that the material in each bag or package to which the mark is thus applied conforms to every requirement of the specification.

5.1 **MARKING** - In addition the following information shall be given on each bag or package or on the label applied to it. The information and BIS Standard Mark shall be applied on each bag in **RED COLOUR.**

- a) Name of the manufacturer and/or registered trade mark, if any;
- b) Type of Portland cement; that is Portland Pozzolana cement (Fly Ash Based) OR PORTLAND POZZOLANA CEMENT (Calcined Clay Based.)
- c) A distinctive Red Color mark encasing the words PPC –( FLY ASH BASED)
- d) Net Mass.
- e) Identification in code or otherwise to enable a week's lot of manufacture to be traced back to factory records. For this purpose each bag shall be marked the week and year of packing.
- f) The words "FOR EXPORT", if required and
- g) Licence Number (CM/L-----)

Note - For each calendar year the first week shall be counted as 7 days from First of January and subsequent week numbered serially accordingly. In such an event the bags shall be marked as WO1.....W51.....etc.

**DOC: STI/1489(Part-1)& (Part-2)/1/LS  
May 2005**

6. **LEVELS OF CONTROL** - The tests, as indicated in Table 1 attached and at the levels of control specified therein, shall be carried out on the whole production of the factory which is covered by this scheme and appropriate records and charts maintained in accordance with paragraph 2.0 above. All the production which conforms to the Indian Standards and covered by the licence shall be marked with certification mark of the Bureau.

6.1 Each of the sample of cement taken for test shall satisfy the requirements of the specification.

6.2 **WEIGHMENT**- One filled bag from each nozzle shall be taken at random twice in a shift of operation and weighed in case of electronic packer with recorder. In all other cases one bag from each nozzle shall be checked once in two hours. The records maintained in Form 1. The weighing and packing machines shall be adjusted as and when necessary as indicated by the mass of these bags in such a way that net mass of each bag shall be 50 kg or 25 kg subject to the tolerances as given in Annex B or clause 9.2.1.1 of IS 1489(Part-1)& (Part-2), as the case may be. Such adjustments for each nozzle shall be recorded in Form 1 under Remarks column.

7.0 **RAW MATERIALS** - Routine analysis of various raw materials going into the manufacture of Portland Pozzolana cement shall be made at intervals of a month or whenever there is a change in the source/mine area stratification which ever is earlier and appropriate records of the analysis and of the Physical composition of the mixtures shall be maintained (see Form 2)

8.0 In respect of all other clauses of the specification the factory will maintain appropriate control and checks to ensure that their product conforms to the various requirements of this specification.

9.0 **REJECTIONS** – A separate record shall be maintained giving information relating to the rejection of the production not conforming to the requirements of the specification and the method of its disposal. Such material shall in no circumstances be stored together with that conforming to the specification.

10.0 **PACKING** – In case cement is packed in jute sacking bags (See clause 10.1 of the standard) the bags shall conform to IS 2580 and duly carry ISI Mark with regard to their conformity to IS 2580 Specification for jute sacking bags for packing cement

10.1 In case cement is packed in multi-wall paper sacks conforming to IS 11761, light weight jute bags conforming to IS 12154, HOPE woven sacks conforming to IS 11652, jute synthetic union bags conforming to IS 12174, a test certificate indicating details of relevant tests results either from the manufacturer or from any recognized testing laboratory shall be received along with each consignment. Alternately the samples of bags from each consignment shall be tested by the cement manufacturer either in his own laboratory or any other recognized laboratory before they are used for packing cement. No testing would be necessary if the bags carry BIS Certificate Mark.

10.2 **MANUFACTURER CERTIFICATE** : (See clause 9.1 of IS) The manufacturer shall furnish with in ten days of dispatch of cement a certificate indicating the percentage of Pozzolana / Fly ash. The manufacturer shall also state in the certificate that the amount of Pozzolana / Fly ash in the finished cement will not vary more than  $\pm 3$  percent from the declared value.

**DOC: STI/1489(Part-1) & (Part-2)/1/LS  
May 2005**

11.0 **SAMPLES** – The licensee shall supply, free of charge, the samples required in accordance with the Bureau of Indian Standards (Certification) Regulations, 1988, as subsequently amended, from the factory or godowns. The Bureau shall pay for the samples taken by it from the open market.

12.0 **REPLACEMENT** – Whenever a complaint is received soon after the goods with Standard Marks have been purchased and used, and if there is adequate evidence that the goods have not been misused, defective goods or their components are replaced or repaired free of cost by the licensee in case the complaint is proved to be genuine and the warranty period (where applicable) has not expired. The final authority to judge the conformity of the product to the Indian Standard shall be with the Bureau.

13.0 In the event of any damages caused by the goods bearing the Standard Mark, or claim being filed by the consumers against BIS Standard Mark and not “conforming to” the relevant Indian Standard, entire liability arising out of such non conforming product shall be of licensee and BIS shall not in any way be responsible in such cases.

14.0 **STOP MARKING** – The marking of the product shall be stopped under intimation to the Bureau if, at any time, there is some difficulty in maintaining the conformity of their product to the specification, or the testing equipment goes out of order. The marking may be resumed as soon as the defects are removed under intimation to Bureau.

15.0 The marking of the product shall be stopped immediately if directed to do so by Bureau for any reason. The marking may then be resumed only after permission by the Bureau. The information regarding resumption of markings shall also be sent to the Bureau.

16.0 **PRODUCTION DATA** – The licensee shall send to BIS as per the enclosed proforma-1 to be authenticated by a Chartered Accountant or by the manufacturer by giving an affidavit/undertaking, a statement of quantity produced, marked and exported by him and the trade value thereof at the end of each operative year of the licence.

Table 1.....

DOC: STI/1489(Part-1)& (Part-2)/1/LS  
May 2005

**IS 1489(Part I/Part 2):1991**  
**Portland Pozzolana Cement**  
(Fly ash based/ Calcined clay Based)  
**Table 1-A Levels of Control ( Raw Material)**  
( Para 6 of the Scheme of Testing & Inspection)

TEST DETAILS				LEVELS OF CONTROL	
Cl.	Requirement	Test Methods		Frequency	Remarks
		Clause	Reference		
1	2	3	4	5	6
4.1	Pozzolana	4.1.1 to 4.1.4	IS 1489 ( Part 1)/ ( Part 2):1991	One sample per week	Fly ash pozzolana shall conform to IS 3812(Part-I) and calcined clay pozzolana shall conform to IS 1344, subject to requirements of 4.1.2 to 4.1.4 of IS 1489 (Part 1) and (Part 2) :1991 [Form No.4 (A) &( B) ]
4.2	Portland cement clinker (Lab Ball Mill Testing)		IS 269:1989	Daily composite sample	i) For chemical requirements (Form 5) ii) Laboratory Ball-Mill Testing is required to be done when there is change in the source of Raw Material or change in design.
4.3	Portland cement		-do-	-	Laboratory ball mill testing is not necessary if such test has been carried out on clinker intended to be used in manufacturer of OPC provided clinker identity is maintained (Form 6 A). Shall be ISI Marked. However, if ordinary Portland cement is being produced in the same factory record shall be maintained as per the relevant STI of cement

**DOC: STI/1489(Part-1)& (Part-2)/1/LS  
May 2005**

**IS 1489(Part I/Part 2):1991  
Portland Pozzolana Cement  
(Fly ash based/ Calcined clay Based)  
Table 1-A, Levels of Control  
(Para 6 of the Scheme of Testing & Inspection)**

TEST DETAILS			LEVELS OF CONTROL		
Cl.	Requirement	Test Methods Clause Reference	Cement Grinding (Form7&8)	Packed Cement (FORM 9)	Remarks
6	Chemical Composition i) Loss on ignition ii) Magnesia(Mgo) iii) Insoluble Material iv) Sulfuric Anhydried	IS 4032:1985  -do-  -do-  -do-	Daily Composite Sample -do- -do- -do-	-	Chemical requirement of 6.1, (I) to (iv) shall comply with those given in table 1 of IS 1489 (Part 1)&(Part 2):1991
9.2	Chloride content	IS 12423	-	Weekly composite sample	This test shall also be carried out whenever there is any change in source of any raw material.
7.	Physical requirements Fineness	IS 4031(Pt.2)	a)Every alternate hour from each mill separately b) Daily composite sample	Daily composite Sample	
7.2	Soundness	Le-chatelier Method of IS 4031(Pt.3)	Daily composite sample	-do-	
7.2	Soundness	Autoclave method of IS 4031(Pt.3)	-do-	-do-	
7.3	Setting time	IS 4031(Pt.5)	One Sample Per Shift(composite sample)	Daily composite sample	
7.4	Compressive Strength	IS 4031(Pt.68)	Daily composite sample	Daily composite Sample	
7.5	Drying Shrinkage	IS 4031(Pt.10)	-	Weekly composite sample	

NOTE - Composite sample shall be made out of hourly samples for the required period Pl IS 3535 - Methods of sampling hydraulic cements)

**DOC: STI/1489(Part-1)& (Part-2)/1/LS  
May 2005**

**Form No. 1**

**FORMAT FOR MAINTENANCE OF TEST RECORDS  
WEIGHMENT CONTROL AT PACKING STAGE (Clause 6.2 of STI)**

Date	Shift	Time (Hourly)	No of Bags	Net mass of bags from nozzles No.1, No. 2,	Remarks

**Form No.2**

**RAW MATERIAL TESTING (CL.7 of STI)**

Date of receipt of material	Date of testing	Name of the Material	Source of supply and consignment No.	Details of analysis for specified requirements

**Form No.3**

**PRODUCTION DATA  
(POST GRINDING DETAILS OF PRODUCTION ACCEPTED & REJECTED  
FOR ISI MARK)  
(CLAUSE 9 OF STI)**

Shift	Quantity	Passed for ISI Marking	Rejected	Remarks
-------	----------	---------------------------	----------	---------



**FORM NO.6A**

**CLINKER GROUND WITH GYPSUM (Daily composite sample)  
(Note under Column 6 of Table 1 A)**

Date of Grinding	Fineness	Soundness (Le-chatelier/ Autoclave method)	Setting Time		Compressive Strength			Sample/Pass /fail	Disposal/Action taken if sample fails
			Initial (IST)	Final (FST)	3 days	7 days	28 days		

**FORM NO. 6 B**

**CLINKER GROUND WITH GYPSUM & POZZOLANA  
(Column 6 of Table I A)**

Date of Grinding	Fineness	Soundness Lechatelier or Autoclave	Setting Initial (IST)	Time Final (FST)	Compressive Strength			Drying Shrinkage (Weekly)	Sample Pass/Fail	Mode of disposal or action taken if sample fails
					3 days	7 days	28 days			

**FORM NO. 7**

**PORTLAND POZZOLANA CEMENT GRINDING/ BLENDING (Daily/Weekly Composite sample)  
(Column 5 of Table 1B)**

Date of Grinding	Loss on Ignition	MgO	Insoluble Material	S O <sub>3</sub>	Fineness	Soundness Le-ch Auto Clave	Setting Time		Compressive Strength			Drying Shrinkage (Weekly)	Sample Pass/Fail	Action taken if sample fails
							IST	FST	3 days	7 days	28 days			

**FORM NO. 8**

**PORTLAND POZZOLANA CEMENT CRINDING (For Alternate hourly Samples) (Column 5 of Table 1B)**

Date of Grinding	Time at	Fineness	Setting Time		Sample fail/pass	Mode of disposal/Action taken if sample fails
			Initial Setting Time(IST)	Final Setting Time (FST)		

DOC: STI/1489(Part-1)& (Part-2)/1/LS

May 2005

FORM NO. 9

PORTLAND POZZOLANA CEMENT PACKING STAGE (Daily/Weekly Composite Samples)  
(Column 6 of Table 1B)

Date of Pcking	Loss on Ignition	Mg O	Insoluble Material	S O 3	Chloride Content (Weekly)	Fine ness	Soundness Le Auto Ch Clave	Setting time IST FST	Compressive Strength 3 7 28 days daysdays	Drying Shrinkage (Weekly)	Sampl e Pass/F ail	Mode of disposal/Acti on taken if sample fails

FORM NO. 10

(See Clause 3 of STI)

S.No.	Date Calibration	Result of Calibration (Test records indicating details of standard values and observed values for each equipment to be kept in proforma for which various columns be devised; as required)	Name of Equipment  Action taken if equipment found defective	Sl. No. (If any) Remarks

Note : The above records are to be kept separately for each equipments.