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SPECIFICATION FOR PRESSURE METER FOR DETERMINATION OF AIR CONTENT OF FRESHLY MIXED CONCRETE

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Indian Standard

SPECIFICATION FOR PRESSURE METER FOR DETERMINATION OF AIR CONTENT OF FRESHLY MIXED CONCRETE

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 29 April 1981, after the draft finalized by the Cement and Concrete Sectional Committee had been approved by the Civil Engineering Division Council.

0.2 The Indian Standards Institution has already published a series of standards on methods of testing cement and concrete. It has been recognized that reproducible and repeatable test results can be obtained only with standard testing equipment capable of giving the desired level of accuracy. The Sectional Committee has, therefore, decided to bring out a series of specifications covering the requirements of equipment used for testing cement and concrete, to encourage their development and manufacture in the country.

0.3 This standard has been prepared to cover the requirements of pressure meter used for the determination of air content of freshly mixed concrete. The method of determining air content using pressure meter has been covered in IS : 1199-1959*.

0.4 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.

0.5 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 be rounded off in accordance with IS : 2-1960†. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

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*Methods of sampling and analysis of concrete.

†Rules for rounding off numerical values (*revised*).

1. SCOPE

1.1 This standard covers the requirements of the pressure meter used for the determination of air content of freshly mixed concrete.

2. PARTS AND ACCESSORIES

2.1 The meter shall consist of a measuring bowl with a conical cover assembly and other accessories (*see* **2.2** to **2.7**).

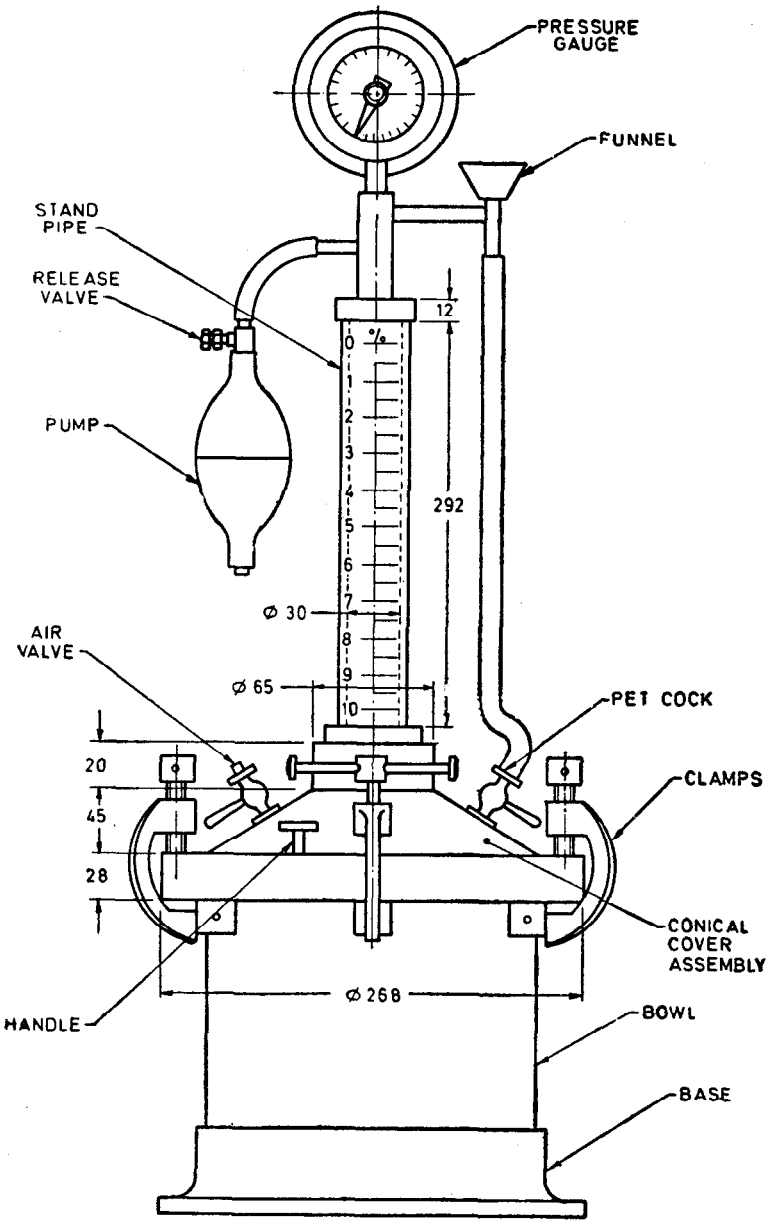
NOTE — Fig. 1 gives the details of a typical pressure meter of 0·005 m^3 capacity.

2.2 Measuring Bowl — It shall be a flanged cylindrical bowl of steel or cast iron or brass or any other hard metal not readily attacked by cement. The outer rim and upper surface of the flange and also its interior surfaces shall be machine-finished. The nominal capacity of the bowl in relation to the maximum size of aggregate in the concrete shall be as given below:

Maximum Nominal Size of Aggregate	*Nominal Capacity of Measuring Bowl*
mm	m^3
38	0·005
75	0·01
150	0·10

2.3 Conical Cover Assembly — The cover shall be flanged, preferably made of steel or cast iron or brass or other hard metal and on-corrodible and shall have interior surfaces inclined not less than 30° from the surface of the flange. The outer rim and lower surface of the flange and the sloping interior shall be such that the cover and the measuring bowl can be fitted together into a pressure tight assembly and the assembly is rigid.

2.3.1 The cover shall be fitted with a stand pipe, which may be a graduated precision bore glass tube or may be of metal of uniform bore with a glass water gauge fixed thereto. The graduations for a suitable range in air content shall be in percent and of divisions not less than 2 mm wide, and to an accuracy of 0·1 percent, as determined by the proper air pressure calibration test. The internal diameter of the stand pipe shall be such that under the normal operating pressure, the water column will be lowered sufficiently to measure air content up to 0·1 percent. The applied pressure shall be shown by a pressure gauge connected to the air chamber above the water column.



All dimensions in millimetres.

FIG. 1 TYPICAL PRESSURE METER OF 0·005 m³ CAPACITY

2.3.2 The cover shall be fitted with a suitable device for venting the air chamber, an air valve, a water inlet valve and a petcock for bleeding off water as required. Means for clamping the cover to the bowl shall be provided to make a pressure tight seal without entrapping air at the joint between the flanges of the cover and bowl. The clamps used for this purpose should be preferably of wing nut tightening type and the seal used should be preferably 0 rings.

2.4 Calibration Cylinder — Calibration cylinder shall consist of a cylindrical measure having an internal volume equal to 3 to 6 percent of the volume of the measuring bowl. It shall be machined from No. 16 gauge brass tubing of proper diameter to which a brass disc 6 mm in thickness is soldered at one end.

2.5 Coil Spring — A coil spring for holding the calibration cylinder in place shall be provided.

2.6 Pressure Gauge — The pressure gauge for the measurement of pressure shall be of 75 mm diameter. The gauge shall have a range of twice the normal working pressure (*see* Note below) and shall be suitably graduated.

NOTE — Pressure of 0·05 to 0·20 N/mm^2 have been used satisfactorily.

2.7 Accessories

2.7.1 *Trowel* — The trowel shall be of the standard brick mason's type.

2.7.2 *Tamping Rod* — A straight steel tamping rod of circular cross section 16 mm diameter, 230 mm long and rounded at one end conforming to tamping rod specification stipulated in IS : 7320-1974* shall be provided.

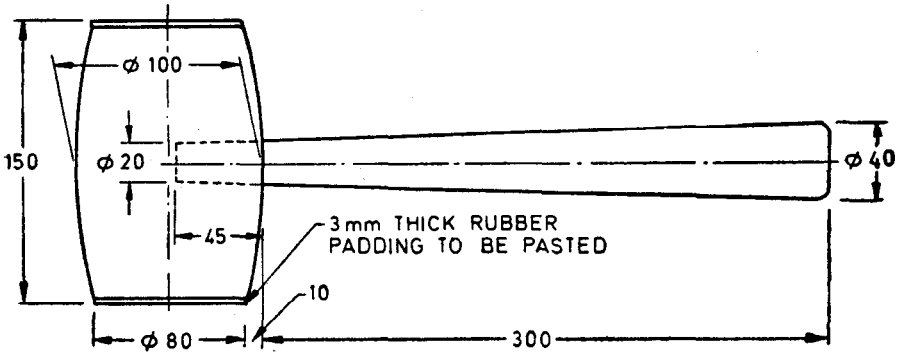
2.7.3 *Mallet* — Mallet shall be made of wood with a rubber or raw hide head weighing about 250 to 500 g depending upon the capacity of the bowl (*see* Fig. 2).

2.7.4 *Strike Off Bar* — Strike-off bar shall be a flat straight steel bar (*see* Fig. 3).

2.7.5 *Funnel* — The funnel shall have a spout fitting into a tube connecting the water inlet valve of the cover assembly.

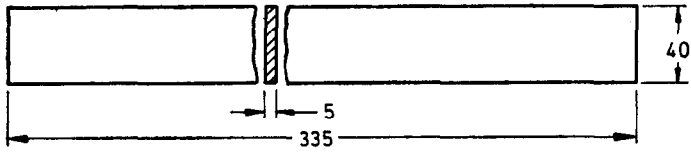
2.7.6 *Pump* — A suitable foot pump for developing the required pressure shall be provided. Alternatively, pressure bulbs of smaller sizes may be provided.

*Specification for concrete slump test apparatus.



All dimensions in millimetres.

FIG. 2 MALLET (WOODEN)



All dimensions in millimetres.

FIG. 3 STRIKE OFF BAR (STEEL PLATE)

3. MARKING

3.1 The following information shall be clearly and indelibly marked on each component of the apparatus in a way that it does not interfere with the performance of the apparatus:

a) Name of the manufacturer or his registered trade-mark or both, and

b) Date of manufacture.

3.1.1 The apparatus may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

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