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IS : 10070 - 1982

*Indian Standard*

Reaffirmed 1989

# SPECIFICATION FOR MACHINE FOR ABRASION TESTING OF COARSE AGGREGATES

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## SPECIFICATION FOR MACHINE FOR ABRASION TESTING OF COARSE AGGREGATES

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## *Indian Standard*

# SPECIFICATION FOR MACHINE FOR ABRASION TESTING OF COARSE AGGREGATES

### 0. FOREWORD

**0.1** This Indian Standard was adopted by the Indian Standards Institution on 28 January 1982, 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** Accordingly, this standard has been prepared to cover requirements of the machine used for testing abrasion value of coarse aggregates. The method of determining abrasion value of coarse aggregate is covered in IS : 2386 ( Part IV )-1963\*.

**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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### 1. SCOPE

**1.1** This standard specifies the requirements of the machine used for testing abrasion value of coarse aggregate.

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\*Methods of test for aggregates for concrete: Part IV Mechanical properties.

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

## 2. MACHINE

2.1 The machine shall be of Los Angeles type.

## 3. MATERIALS

3.1 Materials for different components of the abrasion machine shall be as given in Table 1.

**TABLE 1 MATERIALS OF CONSTRUCTION FOR ABRASION MACHINE ( LOS ANGELES TYPE )**

SL No.	PART	MATERIAL	SPECIAL REQUIREMENTS, IF ANY	RECOMMENDED INDIAN STANDARD SPECIFICATION, IF ANY
(1)	(2)	(3)	(4)	(5)
i)	Cylinder	Mild steel	Smooth surface	IS : 226-1975*
ii)	Stub shaft	Mild steel	Smooth surface	do
iii)	Cover for opening	Mild steel	Smooth surface	do
iv)	Shelf	Mild steel	Smooth surface	do
v)	Frame	Structural steel sections	—	—
vi)	Ball bearing, heavy duty	—	50 mm bore	—
vii)	Motor	—	1 hp, 3 phase, 1440 rpm	—
viii)	Tray	Mild steel	—	IS : 226-1975*
ix)	Abrasive charge	Cast iron spheres	Hardened	—

\*Specification for structural steel ( standard quality ) ( *fifth revision* ).

## 4. DIMENSIONS

4.1 The dimensions with tolerances shall be as given in Fig. 1. Where tolerances are not specified, the dimensions shall be considered as nominal.

NOTE — The allowable deviations for nominal dimensions shall be as laid down for coarse class of deviation in IS : 2102-1969\*.

## 5. CONSTRUCTION

5.1 **Abrasion Machine ( Los Angeles Type )** — The abrasion machine ( Los Angeles type ) shall be constructed as shown in Fig. 1 and shall

\*Allowable deviations for dimensions without specified tolerances ( *first revision* ).



consist of a hollow steel cylinder arranged for rotating about its axis in a horizontal position.

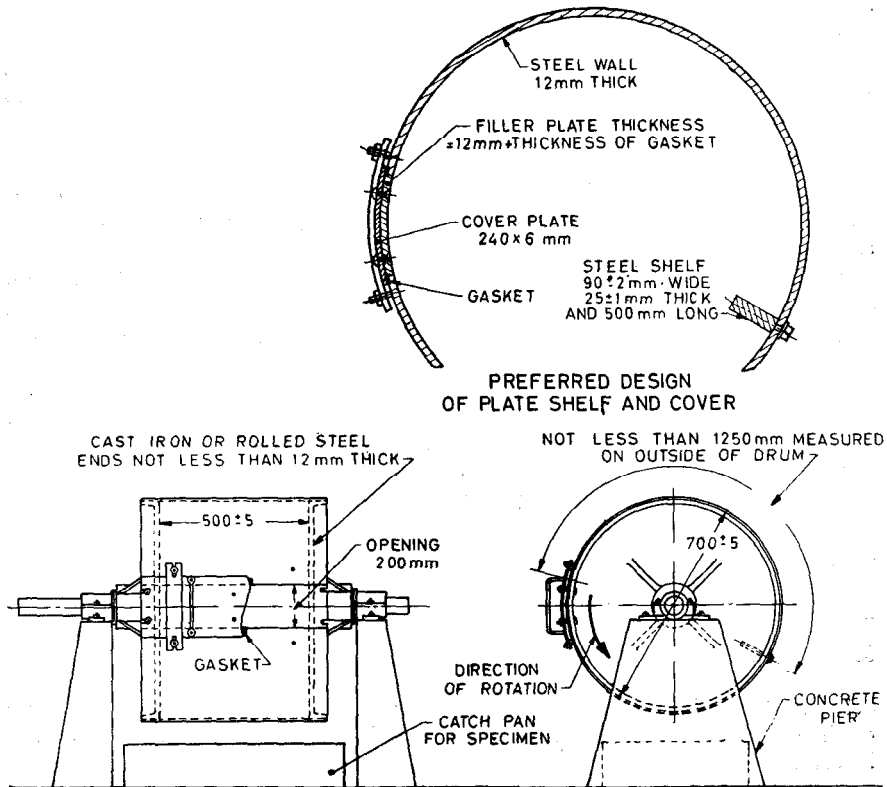


FIG. 1 TYPICAL ABRASION TESTING MACHINE (LOS ANGELES TYPE)

**5.1.1** The hollow cylinder shall be made of steel with its ends closed. The cylinder shall be mounted on stub shafts attached to both the ends but not entering it. Ball bearings housed in brackets shall be mounted over the shafts and the brackets shall be fixed to the frame as shown in Fig. 1. An opening shall also be provided. A removable steel shelf projecting radially into the cylinder and extending its full length shall be mounted along one element of the interior surface of the cylinder. The shelf shall be so mounted by bolts as to be firm and rigid. The position

of the shelf shall be such that the distance from the shelf to the opening measured along the circumference of the cylinder in the direction of rotation shall be not less than 1 250 mm.

**5.1.2 Removable Cover** — A removable cover shall be provided to close the opening on the cylinder dust-tight and this shall be bolted in place. The removable cover shall be made of steel and shall be formed to maintain the cylindrical contour of the interior surface.

**5.1.3 Shelf** — The shelf shall be of mild steel.

**5.1.4 Frame** — The frame shall be of welded structural steel construction. A channel carrying the motor and gear box shall be fixed rigidly to the frame.

**5.1.5 Drive** — The drive should be by means of a chain running over a sprocket on the stub shaft and a sprocket on the shaft of a gear box coupled to a motor ( 1 hp, 3 phase, 1 440 rpm ). A clutch shall be provided. A revolution counter shall be provided to indicate the number of revolutions. The rate of rotation of the cylinder shall be 30-33 rpm.

**NOTE** — It is desirable to equip the drive with a power supply cut-off type revolution counter which stops the machine after completing the specified number of revolutions.

**5.1.6 Tray** — A tray with lifting handles shall be provided.

**5.1.7 Abrasive Charge** — The abrasive charge shall consist of 12 cast iron spheres  $48 \pm 2$  mm in diameter and each weighing between 390 and 455 g and a total of 12 numbers of spheres weighing  $5\,000 \pm 25$  g shall be supplied.

## **6. MARKING**

**6.1** The following information shall be clearly and indelibly marked on each component of the abrasion machine in a way that it does not interfere with the performance of the machine.

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

b) Date of manufacture.

**6.1.1** The aggregate testing machine 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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# **INDIAN STANDARDS**

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### **INSTRUMENTS FOR TESTING CEMENT AND CONCRETE**

#### **IS:**

- 5512-1969 Flow table for use in tests of hydraulic cement and pozzolanic materials
- 5513-1976 Vicat apparatus (*first revision*)
- 5514-1969 Apparatus used in ' Le-Chatelier ' test
- 5515-1969 Compaction factor apparatus
- 5516-1969 Variable flow type air permeability apparatus ( Blaine type )
- 5536-1969 Constant flow type air permeability apparatus ( Lea and Nurse type )
- 5816-1970 Methods of test for splitting tensile strength of concrete cylinders
- 7320-1974 Concrete slump test apparatus
- 7325-1974 Apparatus for determining constituents of fresh concrete
- 9376-1979 Apparatus for measuring aggregate crushing value and 10 percent fines value
- 9377-1979 Apparatus for aggregate impact value
- 9399-1979 Apparatus for flexural testing of concrete
- 9459-1980 Apparatus for use in measurement of length change of hardened cement paste, mortar and concrete
- 9799-1981 Pressure meter for determination of air content in freshly mixed concrete