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SPECIFICATION FOR JOLTING APPARATUS USED FOR TESTING CEMENT

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INDIAN STANDARDS INSTITUTION
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
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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, 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 jolting apparatus required for moulding of the test specimens for the test for determination of transverse strength of plastic mortar. Use of this apparatus is covered in IS : 4031-1968*.

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 India.

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.

*Methods of physical tests for hydraulic cement.
†Rules for rounding off numerical values (*revised*).

1. SCOPE

1.1 This standard covers the requirements of jolting apparatus used in casting specimens of size $40 \times 40 \times 160$ mm for transverse strength test of plastic mortar.

2. MATERIALS

2.1 The materials of construction of different component parts of the jolting apparatus shall be as given in Table 1.

TABLE 1 MATERIALS OF CONSTRUCTION OF DIFFERENT COMPONENTS OF JOLTING APPARATUS

Sl No.	Part	Material	Special Requirements, if any
(1)	(2)	(3)	(4)
i)	Table	Mild steel	—
ii)	Supporting arms	Aluminium	—
iii)	Spindle	Mild steel	Striking face
iv)	Projecting lug	do	Hardened to not less than 650 VH or equivalent
v)	Stop	do	Wearing face hardened to not less than 650 VH or equivalent
vi)	Cam	do	Hardened to not less than 650 VH or equivalent
vii)	Stand	Cast iron	Smooth surface, conforming to IS : 210-1978*
viii)	Bracket	do	Smooth surface, conforming to IS : 210-1978*
ix)	Mould	Mild steel	Conforming to IS : 226-1975†

*Specification for grey iron castings (*third revision*).
†Specification for structural steel (standard quality) (*fifth revision*).

3. DIMENSIONS

3.1 The dimensions of the jolting apparatus with mould shall be generally as given in Fig. 1 and 2. Where tolerances for dimensions are not specifically mentioned dimensions shall be considered nominal.

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

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

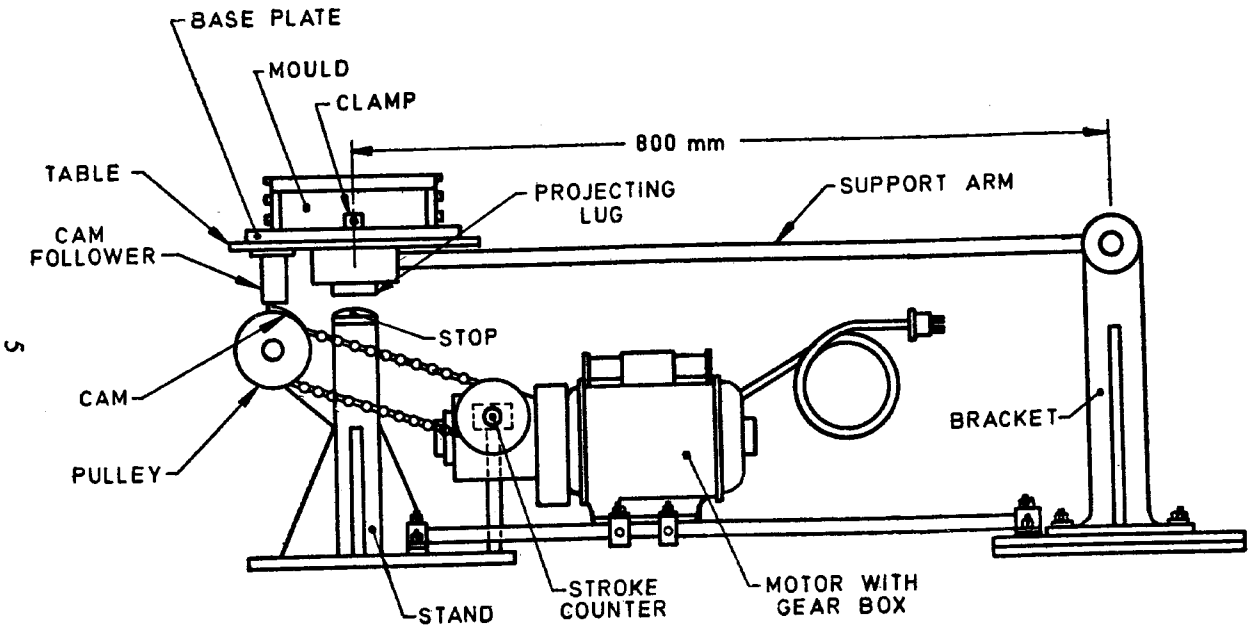
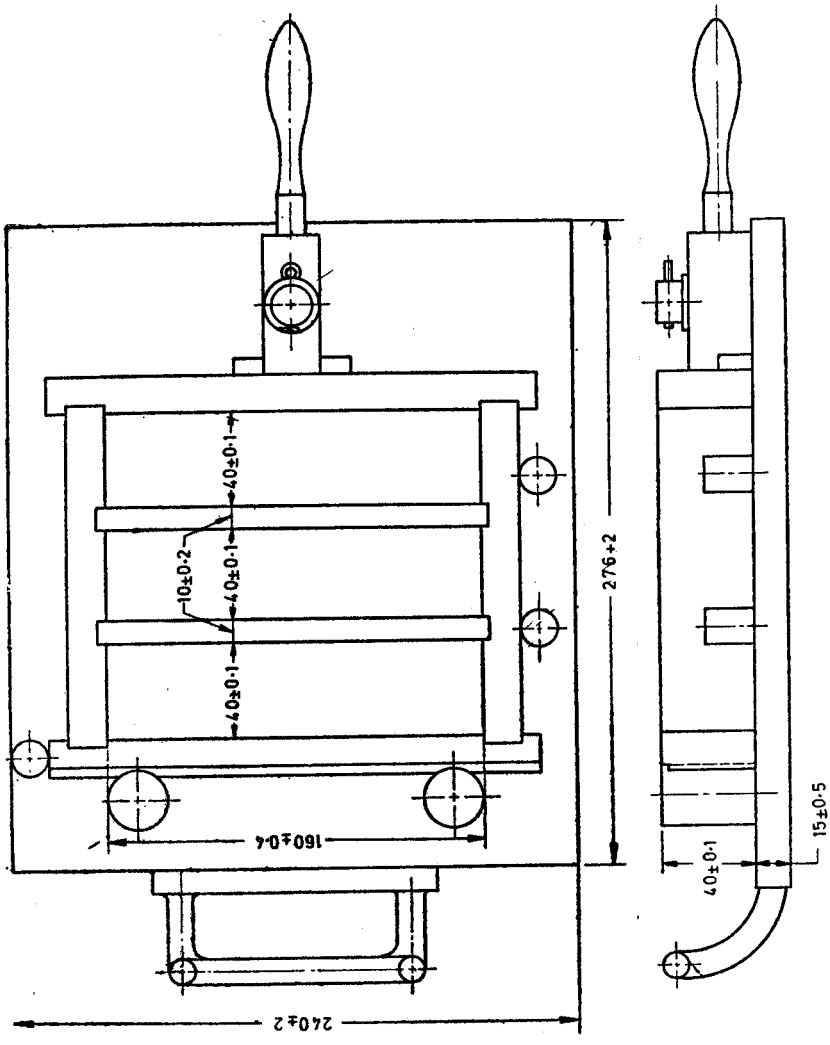


FIG. 1 TYPICAL JOLTING MACHINE



All dimensions in millimetres.

FIG. 2 TYPICAL MOULD 40 × 40 × 160 mm SIZE

4. CONSTRUCTION

4.1 Jolting apparatus shall be constructed as shown in Fig. 1 and shall consist of a table which is raised and allowed to fall through a height of $15 \pm 0{\cdot}1$ mm for new apparatus and $15 \pm 0{\cdot}4$ mm for the apparatus in use by the rotation of a ram.

4.1.1 *Table* — The table shall be machined and shall have on the underside a projecting lug with plane face hardened. At the end, a cam follower shall be fixed. Guide pieces as shown in Fig. 1 shall be provided so that the centre of the central compartment of the mould is directly above the points of percussion. It shall be provided with an arrangement to rigidly fix the mould. The table shall be rigidly fixed to the supporting arms.

NOTE — The combined mass of the table together with mould, hopper and clamps shall be 20 ± 1 kg.

4.1.2 *Supporting Arms* — The supporting arms carrying the table shall be fixed to a spindle mounted on a bracket. The mass of the supporting arms shall be $1{\cdot}0 \pm 0{\cdot}3$ kg.

4.1.3 *Stand* — The stand shall carry a stop having a rounded upper surface, and shall be positioned in such a way that the stop is right beneath the projecting lug of the table. When the projecting lug rests on the stop, its plane face and that of the table shall be horizontal. The common normal through the point of contact of the lug and stop shall be vertical; the lug striking face and the stop shall be replaced as soon as this condition is no longer met.

4.1.4 *Cam* — The cam shall be mounted on the stand as shown in Fig. 1. When the cam is rotated, it shall operate the cam follower raising the table and allowing it to drop. The cam shall be driven at a speed of 60 ± 1 rpm.

4.1.5 *Drive* — The cam shall be driven by means of an electric motor and a reduction gear. Electric motor of 1/3 hp is found suitable. It is recommended that a device be provided which stops the drive automatically after 60 jolts.

4.1.6 *Bracket* — The bracket shall be fixed to a mild steel plate having holes for bolting down to a concrete base. The bracket shall be rigidly connected to a stand with two arms.

4.2 Mould (*see* **Fig. 2**) — The dimensions of the mould with tolerances shall be as specified in Table 2. The general requirements of construction of the mould shall be as laid down in IS : 10086-1982*.

*Specification for moulds for use in tests of cement and concrete.

4.2.1 The mould shall embody three compartments and shall rest on a machined steel base plate to which it shall be clamped securely. The mould shall be surmounted by a hopper made of steel or a non-ferrous metal with vertical walls of 20 mm to 40 mm height. Viewed in plan, the interior vertical surfaces of the hopper shall be within those of the compartment by a distance not exceeding 1 mm. The mass of the mould together with hopper and base shall be $13 \pm 0{\cdot}25$ kg.

TABLE 2 DIMENSIONS AND TOLERANCES OF MOULD OF $40 \times 40 \times 160$ mm SIZE

(*Clause* 4.2)

Sl No.	Description	Dimensions
(1)	(2)	(3)
i)	Length between inner faces, mm	$160 \pm 0{\cdot}4$
ii)	Width between inner faces, mm	$40 \pm 0{\cdot}1$
iii)	Height, mm	$40 \pm 0{\cdot}1$
iv)	Thickness of wall plate (*Min*), mm	10
v)	Angle between the faces and the base	$90 \pm 0{\cdot}5°$
vi)	Permissible variation in the planeness of walls, mm	0·02
vii)	Length of base plate, mm	276 ± 2
viii)	Width of base plate, mm	240 ± 2

5. JOLTING APPARATUS MOUNTING

5.1 The apparatus shall be fixed on a concrete base 1 m long, 30 cm wide and 80 cm high. The base plates of the stand carrying the cam and bracket about which the table rotates shall each be fixed to the concrete base by means of four anchor bolts, and when fixing them a thin layer of rich mortar should be placed between the base plates and the concrete base in order to ensure perfect contact.

5.2 To reduce the noise, the concrete base shall be placed on four rubber pads of $100 \times 100 \times 10$ mm size.

6. MARKING

6.1 The following information shall be clearly and indelibly marked on each component of the jolting apparatus as far as practicable 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.

6.1.1 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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