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Indian Standard

SPECIFICATION FOR VIBRATION MACHINE

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SPECIFICATION FOR VIBRATION MACHINE

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(*Continued on page* 11)

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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 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 vibration machine used for moulding 70·6 mm cement mortar cubes in the test for determination of compressive strength of hydraulic cement. Use of this machine 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 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 vibration machine used in casting cement mortar cubes of 70·6 mm size.

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

2. MATERIALS

2.1 Materials of construction of different components of the vibration machine shall be as given in Table 1.

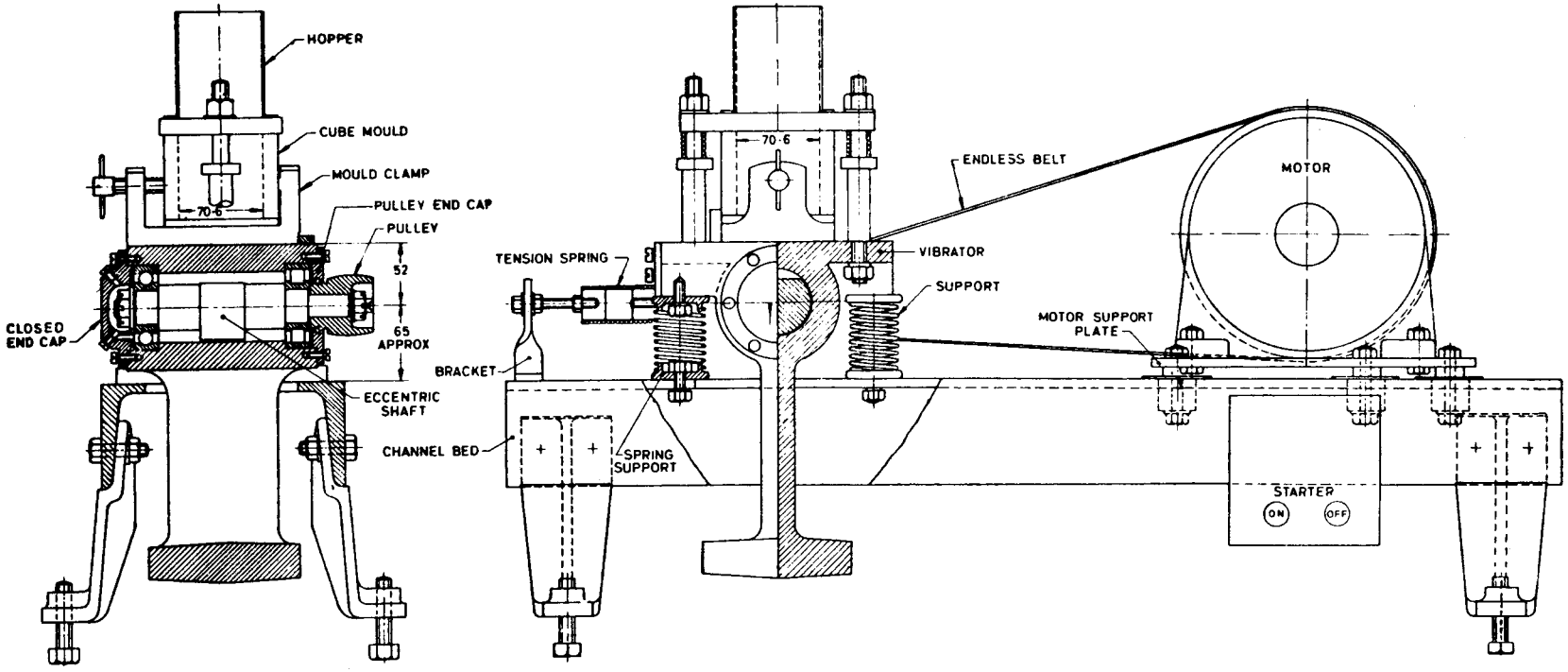
TABLE 1 MATERIALS OF CONSTRUCTION OF DIFFERENT COMPONENTS OF VIBRATION MACHINE

Sl No.	Part	Material	Specific Requirements and Recommended Indian Standard Specification, if Any
(1)	(2)	(3)	(4)
i)	Bed	ISLC 200	—
ii)	Vibrator	Cast iron	Smooth surface, IS : 210-1978*
iii)	Eccentric shaft	Mild steel	IS : 226-1975†
iv)	Pulley	Mild steel	IS : 226-1975†
v)	Support spring	Spring steel	—
vi)	Tension spring	Spring steel	—
vii)	Hopper	Brass	—
viii)	Drive pulley	Cast iron	Smooth surface, IS : 210-1978*
ix)	Belt	Cotton/Nylon	Woven, endless belt
x)	Motor	—	3/4 hp, 2 800 rpm
xi)	Motor support plate	Mild steel	IS : 226-1975†
xii)	Mould	Cast iron/Mild steel	IS : 210-1978*/ IS : 226-1975†

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

3. CONSTRUCTION

3.1 Vibration machine shall be constructed generally as shown in Fig. 1 and shall consist of a vibrator, housing revolving shaft with eccentric supported on four springs, which assembly is mounted over a bed of channel. A motor (3/4 hp, 2 800 rpm) carrying a pulley shall be coupled to the vibrator revolving shaft through an endless belt. A belt guard shall be provided. The machine may be fitted with time switch.



All dimensions in millimetres.

FIG. 1 TYPICAL VIBRATION MACHINE

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3.1.1 The vibrator shall be constructed to comply with the following essential requirements:

a) Mass of vibrator on its supporting springs (excluding solid eccentric and cube hut, including mass of mould, mould clamp and hopper)	29±0·5 kg
b) Out of balance moment of eccentric shaft	0·001 6 kgm
c) Normal running speed of eccentric shaft	12 000±400 rpm

3.1.2 The centre of gravity of the vibrator, including the cube and the mould, shall be either to the centre of the eccentric shaft or within a distance of 25 mm below it. For this purpose, a mild steel plate may be fixed to the vibrator.

3.2 Bed — The bed of the vibration machine shall be made of steel channel and shall be provided with four cast iron feet. It shall be provided with four levelling bolts. Four support springs shall be fitted for positioning the coiled springs. A bracket shall be provided for fixing one end of a tension spring.

3.3 Vibrator

3.3.1 The vibrator shall be mounted over four coiled springs.

3.3.2 The vibrator platform shall be provided with two guide pieces for positioning a cast iron mould clamp which carries a cube mould of size 70·6 mm. A suitable arrangement for mounting a hopper shall be provided and a tension spring shall be fitted as shown in Fig. 1.

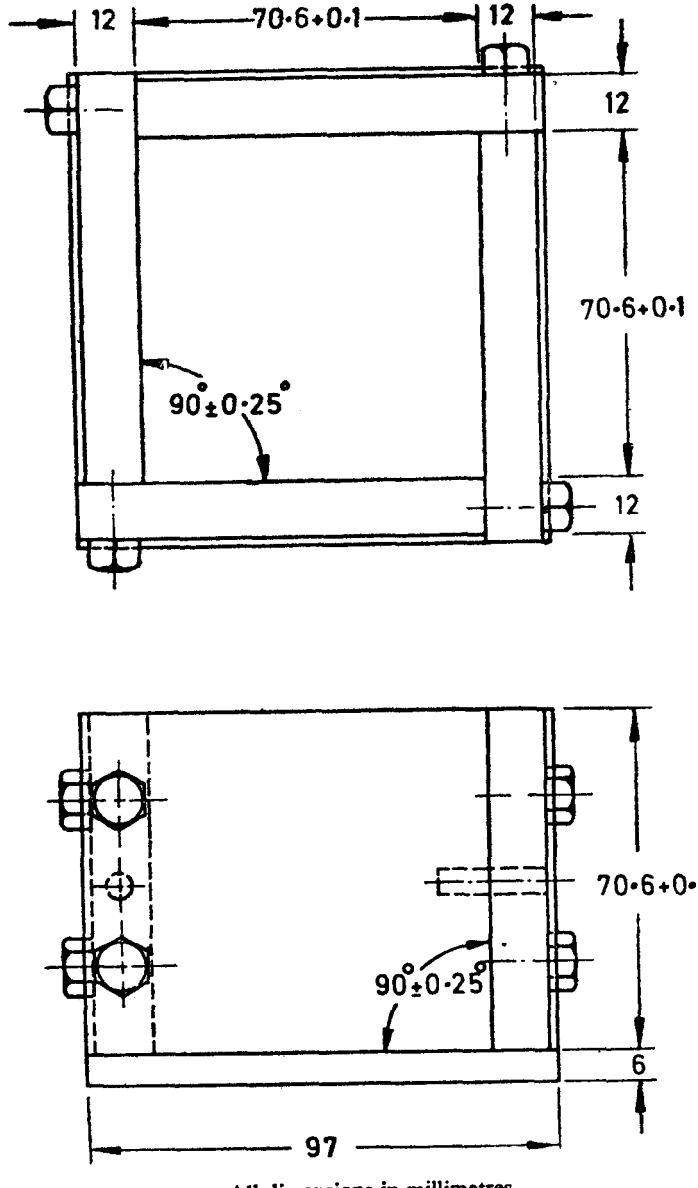
3.3.3 A brass hopper fitted on to a mild steel frame with projecting lugs shall be positioned over the mould as shown in Fig. 1.

3.3.4 The vibrator shall house a revolving shaft with an accurately machined eccentric. A pulley shall be fitted to the shaft.

3.3.5 *Springs* — The springs shall be as shown in Fig. 1. The stiffness of the spring shall be such that the natural frequency of the machine mounted on it is well below its minimum running speed.

3.3.6 *Drive* — The drive should be by an endless belt running on a pulley on the motor and a pulley on the vibrator.

3.4 Mould — The mould shall be of 70·6 mm size and shall be constructed generally in accordance with Fig. 2. The dimensions of the mould with tolerances shall be as specified in Table 2.



All dimensions in millimetres.

FIG. 2 TYPICAL CUBE MOULD, 70·6 mm SIZE

TABLE 2 DIMENSIONS AND TOLERANCES OF MOULD

(*Clause* 3.4)

Sl No.	Description	Dimensions
(1)	(2)	(3)
i)	Distance between opposite faces, mm	70·6 ± 0·1
ii)	Height of mould, mm	70·6 ± 0·1
iii)	Thickness of wall plate, mm	12
iv)	Angle between adjacent interior faces and between interior faces and top and bottom planes of mould	90 ± 0·5°
v)	Length of base plate, mm	97
vi)	Width of base plate, mm	97
vii)	Thickness of base plate, mm	6
viii)	Permissible variation in the planeness of interior faces, mm	
	for new moulds	0·03
	for moulds in use	0·05
ix)	Permissible variation in the planeness of base plate, mm	0·15

3.4.1 The cube mould shall be constructed in such a manner as to facilitate separation into two parts. The mass of the mould together with the base plate shall be 2·8 ± 0·2 kg. Other requirements of the mould shall be as laid down in IS : 10086-1982.*

4. MARKING

4.1 The following information shall be clearly and indelibly marked on each component of the vibration machine 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.

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

4.2 BIS Certification Marking

The product may also be marked with Standard Mark.

4.2.1 The use of the Standard Mark is governed by the provisions of the Bureau of Indian Standards Act, 1986 and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

(*Continued from page* 2)

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AMENDMENT NO. 1 NOVEMBER 1984

TO

IS:10080-1982 SPECIFICATION FOR VIBRATION MACHINE

(*First cover, pages 1 and 3, title*) - Substitute the following for the existing title:

'*Indian Standard*

SPECIFICATION FOR VIBRATION MACHINE FOR CASTING STANDARD CEMENT MORTAR CUBES'

(BDC 2)

Printed at Simco Printing Press, Delhi, India

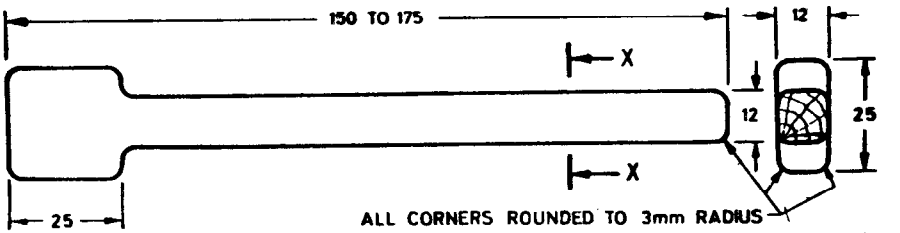
AMENDMENT NO. 2 MARCH 1988

TO

IS : 10080-1982 SPECIFICATION FOR VIBRATION MACHINE FOR CASTING STANDARD CEMENT MORTAR CUBES

(*Page* 9, *clause* **3.4.1**) — Add the following new clause after **3.4.1**:

'**3.5 Poking Rod** — The poking rod shall be made of non-absorptive, non-abrasive, non-brittle material, such as rubber compound having shore A durometer hardness of 80 ± 10, or seasoned teak wood rendered non-absorptive by immersion for 15 minutes in paraffin at approximately 200°C, or ebonite fibre. The poking rod shall be 150 to 175 mm long and shall have cross-section of 12 × 25 mm with tamping face in the form of a blunt torpedo (*see* Fig. 3).'



All dimensions in millimetres.

FIG. 3 POKING ROD

(*Page* 9, *clause* **4.1**) — Substitute the following for the existing clause:

'**4.1** The following information shall be clearly and indelibly marked on each component of the vibration machine and the accessories 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.'

(*Page* 10, *clause* **4.1.1**) — Add the words 'and the accessories' after the word 'machine'.

(BDC 2)

Printed at Simco Printing Press, Delhi, India

AMENDMENT NO. 3 APRIL 2000
TO
IS 10080 : 1982 SPECIFICATION FOR VIBRATION MACHINE FOR CASTING STANDARD CEMENT MORTAR CUBES

[*Page* 9, *Table* 2, *Sl No* .(iii), *col* 3] — Substitute '12.0 to 12.5' *for* '12'.

(CED 2)

Reprography Unit, BIS, New Delhi, India.