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*Indian Standard*

# SPECIFICATION FOR COMPACTION MOULD ASSEMBLY FOR LIGHT AND HEAVY COMPACTION TEST FOR SOILS

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# *Indian Standard*

# SPECIFICATION FOR COMPACTION MOULD ASSEMBLY FOR LIGHT AND HEAVY COMPACTION TEST FOR SOILS

## 0. FOREWORD

**0.1** This Indian Standard was adopted by the Indian Standards Institution on 20 January 1982, after the draft finalized by the Soil Engineering and Rock Mechanics 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 soils. It has been recognized that reliable and intercomparable 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 soils to encourage its development and manufacture in the country.

**0.3** The equipment covered in this standard is used for determination of water content: dry density relation as covered in IS : 2720 ( Part VII )-1980* and IS : 2720 ( Part VIII )-1974†.

**0.4** 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.

## 1. SCOPE

**1.1** This standard covers the requirements of compaction mould assembly used for determination of water content: dry density relation of soils using light and heavy compaction.

*Methods of test for soils: Part VII Determination of water content: dry density relation using light compaction ( *second revision* ).

†Methods of test for soils: Part VIII Determination of water content: dry density relation using heavy compaction ( *first revision* ).

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

## 2. MATERIALS

**2.1** The materials of construction of the different component parts of compaction mould assembly shall be as given in Table 1.

**TABLE 1 MATERIALS OF CONSTRUCTION OF DIFFERENT COMPONENT PARTS OF COMPACTION MOULD ASSEMBLY**

| PART | MATERIAL | SPECIFIC REQUIREMENTS, IF ANY | REFERENCE TO INDIAN STANDARD |
|---|---|---|---|
| Mould, Collar, Base plate | a) Copper alloy | — | IS : 318-1962* |
| | b) Brass | — | IS : 292-1961† |
| | c) Mild steel‡ | Cadmium plated | IS : 513-1973§ |
| Stay rods | Mild steel | Chromium plated | — |
| Wing nuts | Cast steel/Forged steel | Cadmium plated | — |

*Specification for leaded tin bronze ingots and castings ( *revised* ).
†Specification for brass ingots and castings (*revised* ).
‡For short term use.
§Specification for cold rolled carbon steel sheets ( *second revision* ).

## 3. TYPES AND DIMENSIONS

**3.1** The compaction mould assembly shall be of two types ( Types 1 and 2 ). Dimensions of component parts of compaction mould assembly shall be as detailed in Fig. 1 to Fig. 6. Except where tolerances are specifically mentioned against the dimensions, all dimensions shall be taken as nominal dimensions and tolerances as given in IS : 2102-1969* shall apply.

## 4. CONSTRUCTION

**4.1 Compaction Mould** — The compaction mould shall be of two types as detailed in Fig. 2. It shall be cylindrical in shape and finished smooth inside. The mould shall have two eyes either cast integral with the body or welded. It shall have suitable seatings at the top end for positioning the collar.

**4.2 Collar** — The collar shall be made from the same material as that of the mould. It shall be made as detailed in Fig. 3. The collar shall be cylindrical in shape and finished smooth inside. Two eyes either cast or welded to the collar to secure it with the mould and base plate shall be provided. It shall have a suitable seating at the lower end for sitting flush with the mould.

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

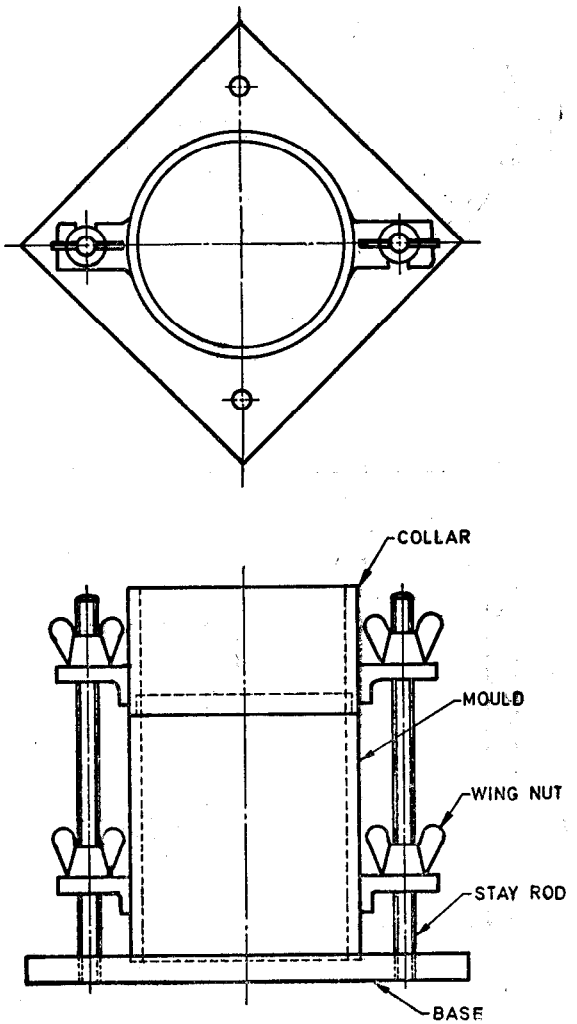
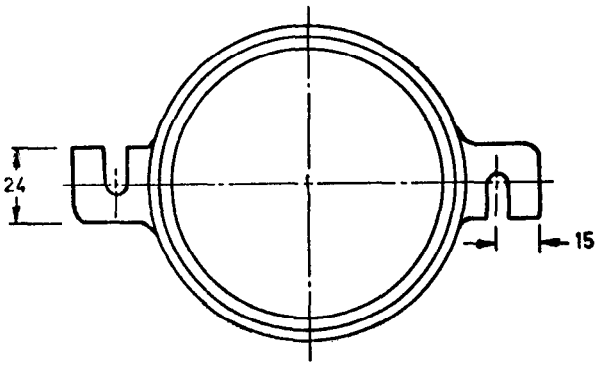
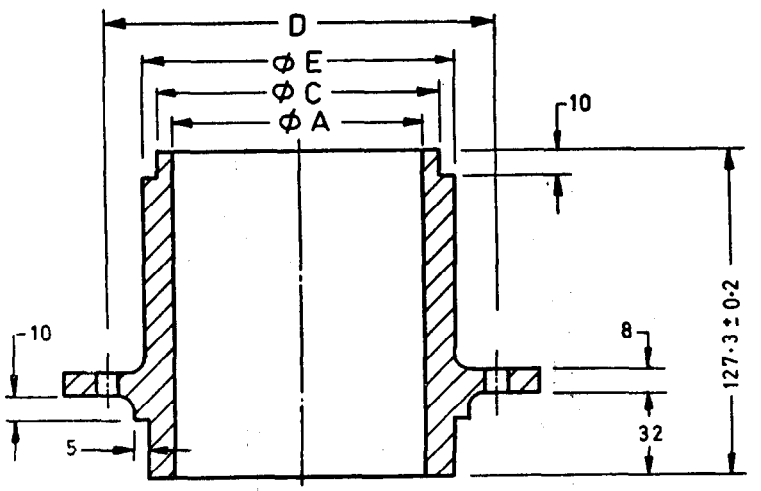



FIG. 1 ASSEMBLY

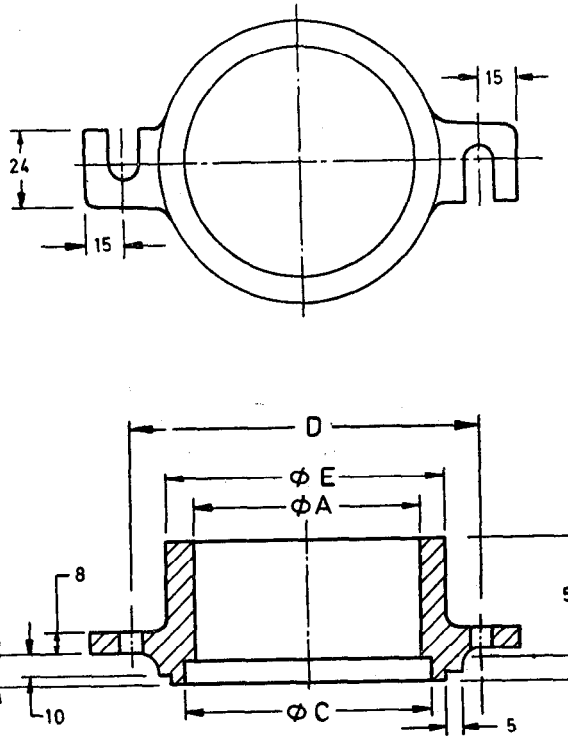



| TYPE | *A* mm | *C* mm | *D* mm | *E* mm |
|---|---|---|---|---|
| 1 | 100 ± 0·4 | 106 | 150 | 112 |
| 2 | 150 ± 0·4 | 156 | 200 | 162 |

All dimensions in millimetres.

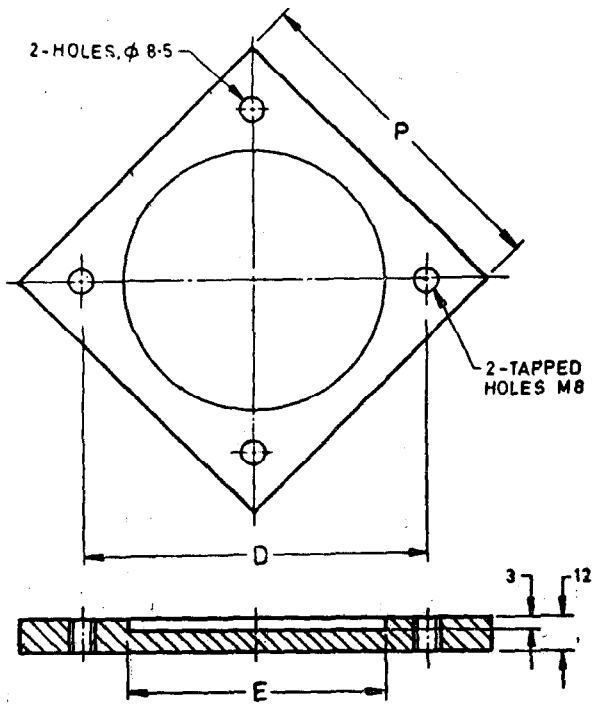
FIG. 2 MOULD




| Type of Mould | *A* mm | *C* mm | *D* mm | *E* mm |
|---|---|---|---|---|
| 1 | 100 ± 0·4 | 106 | 150 | 112 |
| 2 | 150 ± 0·4 | 156 | 200 | 162 |

All dimensions in millimetres.

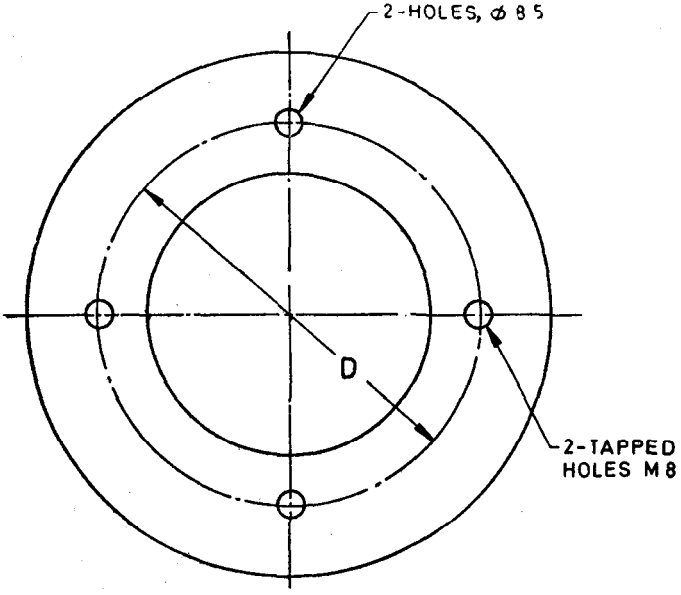
FIG. 3 COLLAR

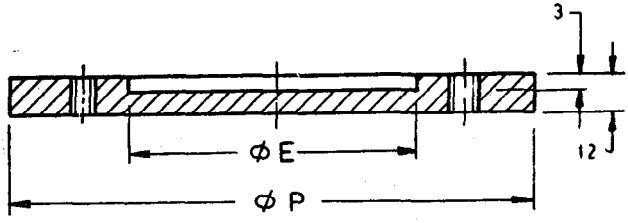



| TYPE OF MOULD | *D* mm | *E* mm | *P* mm |
|---|---|---|---|
| 1 | 150 | 112·5 | 150 |
| 2 | 200 | 162·5 | 200 |

All dimensions in millimetres.

FIG. 4 BASE PLATE ( SQUARE )

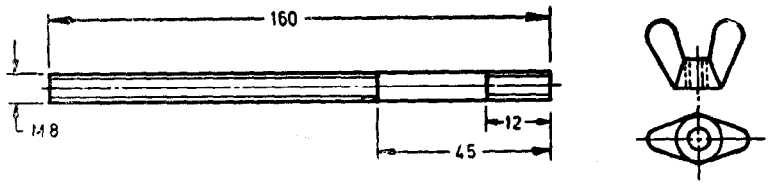



| Type of Mould | *D* mm | *E* mm | *P* mm |
|---|---|---|---|
| 1 | 150 | 120·5 | 180 |
| 2 | 200 | 170·5 | 230 |

All dimensions in millimetres.

FIG. 5 BASE PLATE ( CIRCULAR )




6A Stay Rod 6B Wing Nut

All dimensions in millimetres.

FIG. 6 STAY ROD AND WING NUT

**4.3 Base Plate** — The base plate shall be made from the same material as that of the mould. The base plate shall have a seating 3 mm deep on top face for proper seating of mould. It shall be square in shape and shall be as detailed in Fig. 4. Alternatively, the base plate shall be made circular in shape as detailed in Fig. 5. It shall have two tapped and two plain holes. The tapped holes across the corners or diameter shall be used for fixing the stay rods ( as shown in Fig. 6A ) and the plain holes shall be used to fix the base plate to the base of an automatic compactor. The stay rods shall be fixed to suit the eyes on the mould and collar and four wing nuts ( as shown in Fig. 6B ) shall be used to tighten the mould and collar with the base plate.

## 5. MARKING

**5.1** The following information shall be clearly and indelibly marked on each part of equipment:

a) Name of the manufacturer or his registered trade-mark;

b) Type of material used; and

c) Date of manufacture.

**5.1.1** The equipment 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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# INTERNATIONAL SYSTEM OF UNITS (SI UNITS)

**Base Units**

| *Quantity* | *Unit* | *Symbol* |
|---|---|---|
| Length | metre | m |
| Mass | kilogram | kg |
| Time | second | s |
| Electric current | ampere | A |
| Thermodynamic temperature | kelvin | K |
| Luminous intensity | candela | cd |
| Amount of substance | mol | mole |

**Supplementary Units**

| *Quantity* | *Unit* | *Symbol* |
|---|---|---|
| Plane angle | radian | rad |
| Solid angle | steradian | sr |

**Derived Units**

| *Quantity* | *Unit* | *Symbol* | *Definition* |
|---|---|---|---|
| Force | newton | N | 1 N = 1 kg.m/s$^2$ |
| Energy | joule | J | 1 J = 1 N.m |
| Power | watt | W | 1 W = 1 J/s |
| Flux | weber | Wb | 1 Wb = 1 V.s |
| Flux density | tesla | T | 1 T = 1 Wb/m$^2$ |
| Frequency | hertz | Hz | 1 Hz = 1 c/s ($s^{-1}$) |
| Electric conductance | siemens | S | 1 S = 1 A/V |
| Electromotive force | volt | V | 1 V = 1 W/A |
| Pressure, stress | pascal | Pa | 1 Pa = 1 N/m$^2$ |