**IS 10074 : 2024**

***भारतीय मानक***

***Indian Standard***

**हल्की और भारी मृदा के संहनन परीक्षण के लिए संहनन सांचा एसेम्बली ― विशिष्टि**

*( पहला पुनरीक्षण )*

**Compaction Mould Assembly for Light and Heavy Compaction Test of**

**Soil ― Specification**

*( First Revision )*

ICS 13.080.20**;** 93.020

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भारतीय मानक ब्यूरो

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**November 2024 Price Group X**

Soil and Foundation Engineering Sectional Committee, CED 43

FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Soil and Foundation Engineering Sectional Committee had been approved by the Civil Engineering Division Council.

There are a series of standards on methods of testing of soils. It has been recognized that reliable and inter-comparable test results can be obtained only with the standard testing equipment capable of giving the desired level of accuracy. With this objective, a series of specifications covering the requirements of equipment used for testing soils have been published to encourage their development and manufacture in the country.

The equipment covered in this standard is used for determination of water content: dry density relation as covered in IS 2720 (Part 7) : 1980 ‘Methods of test for soils: Part 7 Determination of water content-dry density relation using light compaction (*second revision*)’ and IS 2720 (Part 8) : 1983 ‘Methods of test for soils: Part 8 Determination of water content — Dry density relation using heavy compaction (*second revision*)’.

This standard was first published in 1982. The present revision has been taken up with a view to incorporate the modifications found necessary as a result of experience gained in the use of this standard. Also, in this revision, the standard has been brought into latest style and format of Indian Standards, and references to Indian Standards, wherever applicable have been updated. Marking clause has been modified to include type of compaction mould assembly in marking. BIS certification marking clause has been modified to align with the revised *Bureau of Indian Standards Act*, 2016.

This standard contributes to the Sustainable Development Goal 9: ‘Industry, innovation and infrastructure’: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation.

The composition of the Committee responsible for the formulation of this standard is given in Annex A.

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 : 2022 ‘Rules for rounding off numerical values (*second* *revision*)’. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

*Indian Standard*

COMPACTION MOULD ASSEMBLY FOR LIGHT AND HEAVY COMPACTION TEST OF SOIL ― SPECIFICATION

*( First Revision )*

**1 SCOPE**

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.

**2 REFERENCES**

The standards given below contain provisions, which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreement based on this standard are encouraged to investigate the possibility of applying the most recent edition of the standards:

|  |  |
| --- | --- |
| *IS No.* | *Title* |
| IS 292 : 1983 | Specification for leaded brass ingots and casting (*second revision*) |
| IS 318 : 1981 | Specification for leaded tin bronze ingots and castings (*second revision*) |
| IS 513 (Part 1) : 2016 | Cold reduced carbon steel sheet and strip: Part 1 Cold forming and drawing purpose (*sixth revision*) |
| IS 2102 (Part 1) : 1993/ ISO 2768-1 : 1989 | General tolerances: Part 1 Tolerances for linear and angular dimensions without individual tolerance indications (*third revision*) |

**3 MATERIALS**

The materials for construction of the different components of compaction mould assembly shall be as given in Table 1.

**Table 1 Materials of Construction of Different Components of Compaction Mould Assembly**

(*Clause* 3)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Sl No.** | **Part** | **Material** | **Specific Requirement, If any** | **Conforming to Indian Standard** |
| (1) | (2) | (3) | (4) | (5) |
| i) | Mould,Collar,Base plate | 1. Copper alloy
 | – | IS 318 |
| 1. Brass
 | – | IS 292 |
| 1. Mild steel
 | Cadmium plated | IS 513 (Part 1) |
| ii) | Stay rods | Mild steel | Chromium plated | – |
| iii) | Wing nuts | Cast steel/forged steel | Cadmium plated | – |

**4 TYPES AND DIMENSIONS**

The compaction mould assembly shall be of two types (Type 1 and Type 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 (Part 1) shall apply.

**5 CONSTRUCTION**

**5.1 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.

**5.2 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.

**5.3 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.



Fig. 1 Assembly



|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Type | Amm | Cmm | Dmm | Emm |
| 1 | 100 ± 0.4 | 106 | 150 | 112 |
| 2 | 150 ± 0.4 | 156 | 200 | 162 |

All dimensions in millimetres.

Fig. 2 Mould



|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Type of Mould | Amm | Cmm | Dmm | Emm |
| 1 | 100 ± 0.4 | 106 | 150 | 112 |
| 2 | 150 ± 0.4 | 156 | 200 | 162 |

All dimensions in millimetres.

Fig. 3 Collar



|  |  |  |  |
| --- | --- | --- | --- |
| Type of Mould | Dmm | Emm | Pmm |
| 1 | 150 | 112.5 | 150 |
| 2 | 200 | 162.5 | 200 |

All dimensions in millimetres.

Fig. 4 Base Plate (Square)



|  |  |  |  |
| --- | --- | --- | --- |
| Type of Mould | Dmm | Emm | Pmm |
| 1 | 150 | 112.5 | 180 |
| 2 | 200 | 162.5 | 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

**6 MARKING**

**6.1** The following information shall be clearly and indelibly marked on each component part of compaction mould assembly:

1. Name of the manufacturer or his registered trade-mark or both;
2. Type of material used;
3. Type of compaction mould assembly (Type 1 or Type 2); and
4. Date of manufacture.

**6.2** **BIS Certification Marking**

The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act*,2016 and the Rules and Regulations framed thereunder, and the products may be marked with the Standard Mark.

**ANNEX A**

(*Foreword*)

**COMMITTEE COMPOSITION**

Soil and Foundation Engineering Sectional Committee, CED 43

| *Organization* |  | *Representative(s)* |
| --- | --- | --- |
| In Personal Capacity (*473, Vinayak Apartments, BHEL Housing Society, Plot No. C-58/19, Sector 62, Noida* - *201301*) |  | Shri C. Pushpakaran **(*Chairperson*)** |
| AFCONS Infrastructure Limited, Mumbai |  | Dr Sunil BasarkarDr Lakshmana Rao Mantri (*Alternate* I)Shri Budhmal Jain (*Alternate* II) |
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| CEM Engineers and Consultants Pvt Ltd, Bhubaneswar |  | Shri Ashok BasaShri Dilip Basa (*Alternate*) |
| Cengrs Geotechnica Pvt Ltd, Noida |  | Shri Sanjay GuptaShri Ravi Sundaram (*Alternate*)  |
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| Central Electricity Authority, New Delhi |  | Shri Baleshwar Thakur Shri Deepak Singh Raghuvansi (*Alternate*) |
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| Central Soil and Materials Research Station, New Delhi |  | Dr Manish Gupta Ms Swapna Varma (*Alternate*) |
| CSIR - Central Building Research Institute, Roorkee |  | Shri Manojit SamantaDr S. Ganesh Kumar (*Alternate*) |
| CSIR - Central Road Research Institute, New Delhi |  | Dr Kanwar SinghDr P. S. Prasad (*Alternate*) |
| CSIR - Structural Engineering Research Centre, Chennai |  | Dr P. KamatchiShrimati R. Sreekala (*Alternate*) |
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| Delhi Technological University, New Delhi |  | Prof Ashok Kumar Gupta  |
| Engineers India Limited, New Delhi |  | Shri V. K. PanwarShri Sampat Raj (*Alternate*) |
| Geodynamics Ltd, Vadodara |  | Dr Ravikiran Vaidya Shri Sujan Kulkarni (*Alternate*) |
| Geological Survey of India, Kolkata  |  | Dr Timir Baran GhosalShri Prashant Tukaram Ilamkar (*Alternate*) |
| Ground Engineering Limited, New Delhi |  | Shri Ashok Kumar Jain Shri Neeraj Kumar Jain (*Alternate*) |
| Hindustan Construction Company Limited, Mumbai |  | Representative  |
| Indian Geotechnical Society, New Delhi |  | Prof H. N. RameshDr Anil Joseph (*Alternate* I) Prof D. Neelima Satyam (*Alternate* II) |
| Indian Institute of Science, Bengaluru |  | Prof Jyant KumarProf G. Madhavi Latha (*Alternate*) |
| Indian Institute of Technology Bombay, Mumbai |  | Prof Deepankar ChoudhuryProf Dasaka Murty (*Alternate*) |
| Indian Institute of Technology Delhi, New Delhi  |  | Dr G. V. RamanaDr J. T. Shahu (*Alternate*) |
| Indian Institute of Technology Kanpur, Kanpur  |  | Prof Priyanka Ghosh |
| Indian Institute of Technology Madras, Chennai |  | Prof Subhadeep BanerjeeProf Ramesh K. Kandasami (*Alternate*) |
| Indian Institute of Technology Roorkee, Roorkee |  | Dr Mahendra SinghDr Vishwas A. Sawant (*Alternate*) |
| Indian Road Congress, New Delhi |  | Secretary General Director (T) (*Alternate*) |
| Indian Society of Earthquake Technology, Roorkee |  | Prof B. K. MaheswariProf Vasant A. Matsagar (*Alternate*) |
| ITD Cementation India Ltd, Kolkata |  | Shri Manish Kumar Shri Aminul Islam (*Alternate*) |
| Jadhavpur University, Kolkata  |  | Prof Sibapriya Mukherjee Prof Ramendu Bikas Sahu (*Alternate*) |
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| L&T GeoStructure Private Limited, Chennai |  | Shri M. KumaranShri A. Vetriselvan (*Alternate*) |
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| National Institute of Disaster Management, New Delhi |  | Dr Chandan GhoshDr Amir Ali Khan (*Alternate*) |
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| Power Grid Corporation of India Limited, Gurugram |  | Representative |
| Research Designs and Standards Organization (Ministry of Railways), Lucknow |  | Shri Sameer Singh Shri S. K. Ojha (*Alternate*) |
| RITES Limited, Gurugram |  | Shri Koshy VaidyanShri Sumeet Mahajan (*Alternate*) |
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| STUP Consultants Pvt Ltd, Mumbai |  | Shri Anirban SenguptaShri Yogesh Waingankar (*Alternate*) |
| Tata Consulting Engineers Limited, Mumbai |  | Shri Sanjeev Gupta  Shri B. N. Nagaraj (*Alternate*) |
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| The Pressure Piling Co (I) Pvt Limited, Mumbai |  | Shri V. C. Deshpande Shri Pushkar V. Deshpande (*Alternate*) |
| Unique Geocivil Services Pvt Ltd, Surat |  | Shri Nehal H. DesaiShri Hitesh H. Desai (*Alternate* I)Shri Dhruval D. Shah (*Alternate* II) |
| In Personal Capacity (*1-B, Villakkupattam Palace, First Floor, 48, New Avadi Road, Kilpauk, Chennai - 600010*) |  | Dr V. Balakumar |
| BIS Directorate General |  | Shri Dwaipayan Bhadra, Scientist ‘E’/Director and Head (Civil Engineering) [Representing Director General (*Ex-officio*)] |
| *Member Secretary*Shri Dheeraj DamachyaScientist ‘B’/Assistant Director (Civil Engineering), BIS |