***भारतीय मानक***

***Indian Standard***

**IS 11594 : 2024**

**मृदु इस्तपात की पतली भित्तिदार वाली नमूना नलियां और नमूना सिरे ― विशिष्टि**

*( पहला पुनरीक्षण )*

**Mild Steel Thin Walled Sampling Tubes and Sampler**

**Heads ― Specification**

( *First Revision* )

ICS 13.080.20; 93.020

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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 manufacturing in the country.

The equipment covered in this standard is used for carrying out undisturbed sampling of soils covered in IS 2132 : 1986 'Code of practice for thin-walled tube sampling of soils (*second revision*)'.

This standard was first published in 1985. 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. The other major modifications incorporated in this revision of the standard are given below:

1. Existing sizes of 40 mm, 65 mm and 80 mm sampling tubes have been replaced with 38 mm, 50 mm and 75 mm considering the actual requirement of sample size for various laboratory tests.
2. Requirement of cutting shoe for sizes 38 mm and 50 mm has been removed considering the practical difficulty of providing threads in shoes of very less wall thickness.
3. Connection between sampler head and the tube has been modified to internal threading or bolting as per the current manufacturing practice to provide stronger and more stable connection between the tube and the sampler head.
4. Other dimensional requirements for the sampling tube, cutting shoes and sampler heads have also been modified considering the above changes in the size of the tube as well the requirements for inside clearance, area ratio and outside clearance as given in IS 1892 : 2021 ‘Subsurface investigation for foundations ― Code of practice (*second revision*)’.
5. 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 formulation of the 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*

**MILD STEEL THIN WALLED SAMPLING TUBES**

 **AND SAMPLER HEADS ― SPECIFICATION**

(*First Revision*)

**1 SCOPE**

This standard covers requirements for thin walled sampling tubes and sampler heads for *in-situ* sampling of soils, as required for open drive tube samplers.

**2 REFERENCES**

The following standards contain provisions, which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated are 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 editions of the standards indicated below:

|  |  |
| --- | --- |
| *IS No.* | *Title* |
| IS 1239 (Part 1) : 2004 | Steel tubes, tubulars and other wrought steel fittings ― Specification : Part 1 steel tubes (*sixth revision*) |
| IS 1892 : 2021  | Subsurface investigation for foundations — Code of practice (*second revision*) |
| IS 1875 : 1992 | Carbon steel billets, blooms, slabs and bars for forgings ― Specification (*fifth revision*) |
| IS 2809 : 1972 | Glossary of terms and symbols relating to soil engineering (*first revision*) |
| IS 4432 : 1988 | Specification for case hardening steels (*first revision*) |

**3 TERMINOLOGY**

For the purpose of this standard, definitions given in IS 2809 shall apply.

**4 MATERIALS**

Materials of construction for sampling tubes shall be as given in Table 1.

**Table 1 Materials of Construction for Different Components of the Sampling Tubes**

(*Clause* 4)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Sl No.** | **Part** | **Material** | **Special Requirement** | **Conforming to Indian Standard** |
| (1) | (2) | (3) | (4) | (5) |
| i) | Tube  | Mild steel | Smooth surface | Light tubes as per IS 1239 (Part 1)  |
| ii) | Cutting shoes | Mild steelcase hardened |  45-50 HRC, with smooth surface | IS 4432  |
| iii) | Sampler head | Mild steel | – | IS 1875, IS 2062 |

**5 DIMENSIONS**

There shall be four sizes, 38, 50, 75 and 100 mm based on the internal diameter of the sampling tube. The tolerance on all dimensions shall be + 0.5 mm.

**6 CONSTRUCTION**

The sampling tubes, cutting shoes (or cutting edges) and sampler heads shall be made as per details given in Table 2 read along with Fig. 1 (*see* Note). The length shall be as desired. For sampling tube having internal diameter 38 mm and 50 mm, it is not practical to provide cutting shoe keeping in view the requirement to maintain inside clearance and area ratio as laid down in **7.7.2.1** of IS 1892. In such cases, one end of the tube shall be tapered. Sampler head shall have external threads (*see* Fig. 1) or bolting arrangement for connection (*see* Fig. 2) with sampling tube.

NOTE ⎯ The cutting shoes are so designed so that an area ratio within 20 percent, and inside clearance of 1 to 3 percent can be provided (*see* IS 1892).

**Table 2 Dimensions of Sampling Tubes, Cutting Shoes and Sampler Heads**

(*Clause* 6)

All dimensions in millimetres.

|  |  |  |
| --- | --- | --- |
| **Sl No.** | **Dimensions** | **Size** |
| **38** | **50** | **75** | **100** |
| (1) | (2) | (3) | (4) | (5) | (6) |
| i) | Nominal diameter of tube (*D*s) | 38 | 50 | 75 | 100 |
| ii) | Thread size (*T*), wherever applicable  | M45x3 | M75x3 | M85x3 | M110x3 |
| iii) | Bolt size (*B*), wherever applicable | 10 | 10 | 10 | 12 |
| iv) | Outer diameter of sampling tube/ sampler head (*D*T) | 40.0 - 41.5 | 52.5 - 54.5 | 78 - 80 | 104 - 106 |
| v) | Outer diameter of shoes (*D*w)1) | ~~–~~ | ~~–~~ | 82 | 108 |
| vi) | Internal diameter of cutting egde/shoes (*D*c) 1) | ~~–~~ | ~~–~~ | 73 | 98 |
| vii) | Outer diameter of cutting edge (*Dw*’)1) | ~~–~~ | ~~–~~ | 77 | 103 |
|  | 1) Cutting shoes are not provided in case of sizes 38 mm and 40 mm considering the practical difficulty of providing threads in shoes of very less wall thickness. |



All dimensions in millimetres.

FIG. 1 DETAILS OF SAMPLING TUBE THREADED WITH SAMPLER HEAD

****

All dimensions in millimetres.

FIG. 2 DETAILS OF SAMPLING TUBE BOLTED WITH SAMPLER HEAD.

**7 MARKING**

**7.1** The following information shall be clearly and indelibly marked on each component of the equipment:

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

b) Size and length of the sampling tube; and

c) Date of manufacture.

**7.2** **BIS Certification Marking**

The product 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 product 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, Uttar Pradesh* - *201301* | Shri C. Pushpakaran **(*Chairperson*)** |
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| Engineers India Limited,  New Delhi | Shri V. K. Panwar Shri Sampat Raj (Alternate-I) Shri Anil Banoth (*Young Professional*) |
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| Geological Survey of India,  Kolkata  | Dr Timir Baran Ghosal Shri Prashant Tukaram Ilamkar (*Alternate*) |
| Ground Engineering Limited,  New Delhi | Shri Ashok Kumar Jain  Shri Neeraj Kumar Jain (*Alternate*) |
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| Indian Institute of Technology  Delhi, New Delhi  | Dr G. V. Ramana Dr J. T. Shahu (Alternate-I) Dr Prashanth Vangla (*Young Professional*) |
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| Indian Institute of Technology  Madras, Chennai | Prof Subhadeep Banerjee Prof Ramesh K Kandasami (*Alternate*) |
| Indian Institute of Technology  Bombay, Mumbai | Prof Deepankar Choudhury Prof Dasaka Murty (*Alternate*) |
| Indian Institute of Technology  Roorkee, Roorkee | Dr Mahendra Singh Dr Vishwas A. Sawant (*Alternate*) |
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| Indian Society of Earthquake  Technology, Roorkee | Prof B. K. Maheswari Prof Vasant A. Matsagar (*Alternate*) |
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| Unique Geocivil Services Pvt Ltd,  Surat | Shri Nehal H. Desai Shri 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 |