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Mazdoor Kisan Shakti Sangathan

“The Right to Information, The Right to Live”

“पुराने को छोड़ नये के तरफ”

Jawaharlal Nehru

“Step Out From the Old to the New”

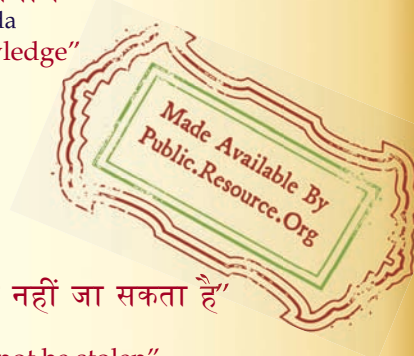
IS 12175 (1987): rapid moisture meter for rapid determination of water content for soil [CED 43: Soil and Foundation Engineering]



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“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

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Indian Standard

**SPECIFICATION FOR RAPID MOISTURE
METER FOR RAPID DETERMINATION OF
WATER CONTENT FOR SOIL**

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Indian Standard

SPECIFICATION FOR RAPID MOISTURE METER FOR RAPID DETERMINATION OF WATER CONTENT FOR SOIL

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Indian Standard

SPECIFICATION FOR RAPID MOISTURE METER FOR RAPID DETERMINATION OF WATER CONTENT FOR SOIL

0. FOREWORD

0.1 This Indian Standard was adopted by the Bureau of Indian Standards on 17 August 1987, after the draft finalized by the Soil Engineering Sectional Committee had been approved by the Civil Engineering Division Council.

0.2 The Bureau of Indian Standards 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 as a part of the assembly for the equipment used for the determination of water content from the gas pressure developed by the reaction of calcium carbide with the free water of the soil covered in IS : 2720 (Part 2)-1973*.

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 moisture meter used for rapid determination of water content from the gas pressure developed by the reaction of calcium carbide with the free water of the soil.

*Methods of test for soils : Part 2 Determination of water content (*second revision*).

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

2. DIMENSIONS

2.1 Dimensions of the equipment with different component parts of the equipment shall be as detailed in Fig. 1 to 5. Except where tolerances are specifically mentioned against the dimensions, all dimensions shall be taken as nominal dimensions and tolerances shall be as given in IS : 2102 (Part 1)-1980* for medium class.

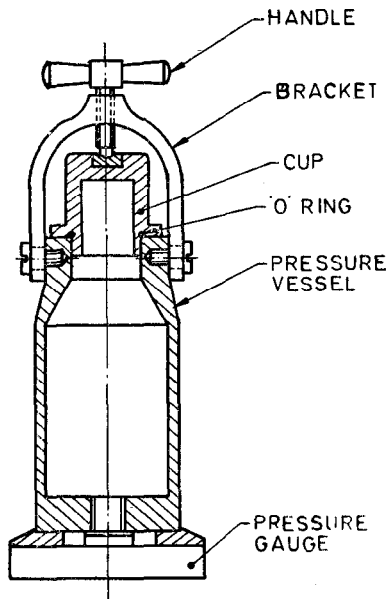


FIG. 1 ASSEMBLY

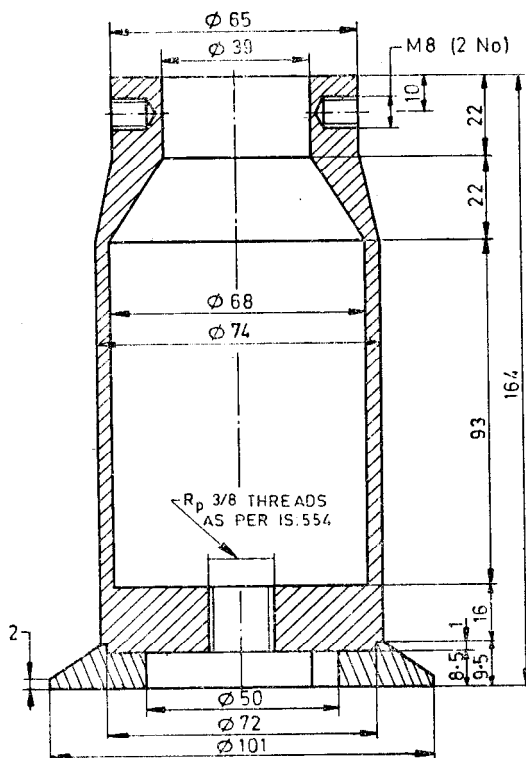
3. MATERIAL

3.1 The materials of construction of various component parts of the equipment shall be as given in Table 1.

4. CONSTRUCTION

4.1 The mating parts of the pressure vessel and the cup shall be machined properly to ensure a proper and leak-proof seating when assembled with ring fitted in its position.

*General tolerances for dimensions and form and position: Part 1 General tolerances for linear and angular dimensions (*second revision*).

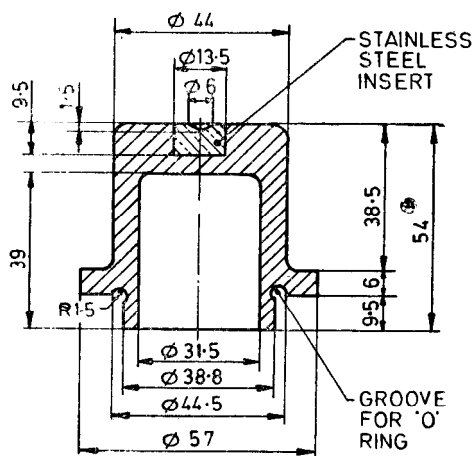


All dimensions in millimetres.

FIG. 2 PRESSURE VESSEL

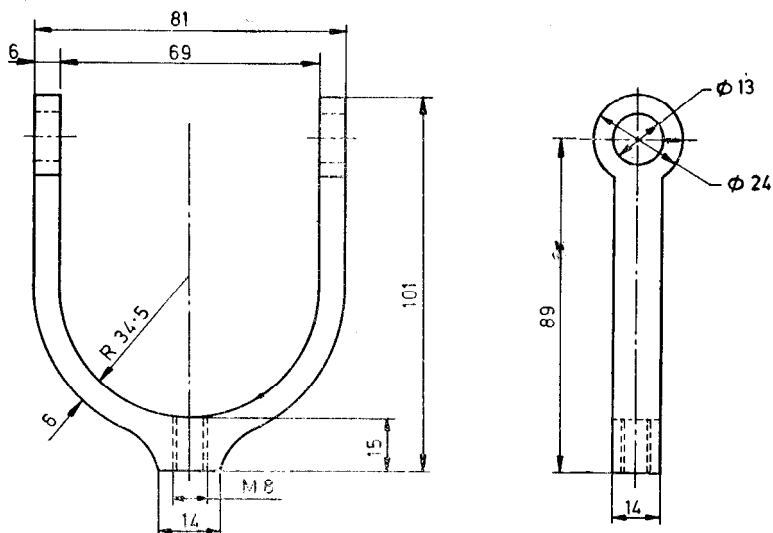
4.2 Pressure Gauge — A pressure gauge shall be fitted as shown in Fig. 1 to the pressure vessel. The dial of the pressure gauge shall be calibrated in percentage of water content either in the range of 0-25 percent or 0-50 percent for two different ranges of the moisture meters on the basis of dry soil. The minimum divisions on the dial shall be 1 percent.

4.3 Steel Balls — Three steel balls of about 12.5 mm diameter and one steel ball of 25 mm diameter shall be provided with the moisture meter.



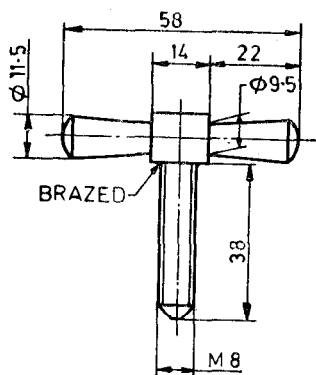
All dimensions in millimetres.

FIG. 3 CUP



All dimensions in millimetres.

FIG. 4 BRACKET



All dimensions in millimetres.

FIG. 5 HANDLE

TABLE 1 MATERIALS OF CONSTRUCTION OF COMPONENT PARTS OF RAPID MOISTURE METER

(Clause 3.1)

Sl. No.	EQUIPMENT PART	MATERIAL	SPECIAL REQUIREMENT, IF ANY,	RELEVANT INDIAN STANDARD
(1)	(2)	(3)	(4)	(5)
i)	Pressure vessel	Aluminium alloy	Shall be machined smooth from inside	IS : 617-1975*
ii)	Cup			
	a) Body	Aluminium alloy	do	IS : 617-1975*
	b) Inset	Stainless steel	do	IS : 6603-1972†
iii)	Bracket	Copper alloy	Nickel/Chrome plated	IS : 318-1981‡
iv)	Handle	Mild steel	do	IS : 513-1986§
v)	'O' Ring	Synthetic rubber		IS : 5382-1969
vi)	Balls	Steel		IS : 4398-1972¶
vii)	Pressure gauge	Conforming to requirements for industrial concentric scale gauge Class IA covered in IS : 3624-1979**		

*Specification for aluminium and aluminium alloy ingots and castings for general engineering purposes (*second revision*).

†Specification for stainless steel, bars and flats.

‡Specification for leaded tin bronze ingots and castings (*second revision*).

§Specification for cold rolled carbon steel sheets (*third revision*).

||Specification for rubber sealing rings for gas mains, water mains and sewers.

¶Specification for carbon-chromium steel for the manufacture of balls, rollers and bearings races (*first revision*).

**Specification for pressure and vacuum gauges (*first revision*).

5. MARKING

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

- a) Name of the manufacturer or his registered trade-mark or both,
- b) Date of manufacture, and
- c) Type of material.

5.1.1 The equipment may also be marked with the Standard Mark.

NOTE — 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 Standard 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 BIS and operated by the producer. Standard marked products are also continuously checked by BIS for conformity to that standard as a further safeguard. Details of conditions, under which a licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

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INTERNATIONAL SYSTEM OF UNITS (SI UNITS)

Base Units

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

Supplementary Units

<i>Quantity</i>	<i>Unit</i>	<i>Symbol</i>
Plane angle	radian	rad
Solid angle	steradian	sr

Derived Units

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