AMENDMENT NO. 1 DECEMBER 2008
TO
IS 1269 (PART 1) : 1997 LEGAL METROLOGY — MATERIAL MEASURES OF LENGTH

PART 1 WOVEN METALLIC AND GLASS FIBRE TAPE MEASURES

(Second Revision)

(*Page* 5, *clause* **6.3.2**) — Substitute the following for the existing clause:

'The tape measure shall be graduated only in metric units. In addition to it, graduations in units other than metric units may be made such that it shall not interfere with graduations in metric units. However indication of units other than metric units shall not be made on any surface of the tape measure.'

Reprography Unit, BIS, New Delhi, India

IS 1269 (Part 1) : 1997
(Reaffirmed 2013)
(Reaffirmed 2018)
(Reaffirmed 2024)

भारतीय मानक

माप विज्ञान — लम्बाई मापन उपकरण

भाग 1 धात्विक तथा काँच रेशों का बुना हुआ मापन टेप

(दूसरा पुनरीक्षण)

Indian Standard

LEGAL METROLOGY — MATERIAL MEASURES OF LENGTH

PART 1 WOVEN METALLIC AND GLASS FIBRE TAPE MEASURES

(Second Revision)

ICS 17.040 30

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

July 1997

Price Group 4

Commercial Weights and Measures Sectional Committee, LM 06

FOREWORD

This Indian Standard (Second Revision) was adopted by the Bureau of Indian Standards after the draft finalized by the Commercial Weights and Measures Sectional Committee had been approved by the Light Mechanical Engineering Division Council

This standard was first published in 1958 and subsequently revised in 1964 Its second revision has been brought out to include the requirements of steel tape measures, which were covered earlier in IS 1270 1965 'Specification for metric, steel tape measures (winding) type' and to publish this standard in two parts as follows

Part 1 Woven metallic and glass fibre tape measures, and

Part 2 Steel tape measures

This standard (Part 1) covers the requirements for woven metallic and glass fibre tape measures

This revision is based on the suggestions received from the Directorate of Weights and Measures as a result of practical application of the standard, more so as the *Standards of Weights and Measures Act* was revised in 1976 The contents of this standard have been aligned with OIML Recommendation, OIML R - 35 1977, 'Material Measures of Length for general use' issued by International Organization of Legal Metrology, France As a result of this harmonization, the following modifications have been made in this revision

a) The definitions/terminology involved in Legal Metrology have been included

b) The tape lengths covered in this standard are extended upto 100 meters nominal length Tapes for 0 5 m, 1 0 m, 1 5 m, 3 m and 4 m denomination are included considering the maximum use of these tapes by the common consumer required for measurements in day-to-day applications

c) Fabric and plastic material has been included for manufacture of tapes upto 5 m denomination

d) The graduation scale marking pattern on the tapes has been revised to give more clarity, and to avoid any confusion while taking actual measurements Marking clause has also been revised

e) The values of maximum permissible errors for graduation marking on tapes are redefined and based on the permissible errors, classification has been made into three accuracy classes

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 'Rules for rounding off numerical values (*revised*) 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

LEGAL METROLOGY — MATERIAL MEASURES OF LENGTH

PART 1 WOVEN METALLIC AND GLASS FIBRE TAPE MEASURES

(Second Revision)

1 SCOPE

1.1 This standard (Part 1) specifies the requirements for woven metallic and glass fibre tape measures intended for use where it is not possible to employ rigid measures of length

1.1.1 It does not apply to high-precision tapes used by industry in the field of mechanics or geodesy (for example gauge blocks, geodetic wire, precision scales)

2 TERMINOLOGY

For the purpose of this standard, the following definitions shall apply

2.1 Material Measures of Length

The length measures covered by this standard are material measures with scale marks, the distances between which are indicated in legal units of length

2.1.1 *Nominal Length*

The nominal length of a length measure is the total value of the material length of that measure by which it is designated

2.1.2 *Principal Scale Marks*

The principal scale marks are the two marks, the distance between which represents the nominal length of the measure under reference condition

2.2 Types of Measures

2.2.1 *End Measure*

An end measure is one that has principal scale marks corresponding to the two end surfaces or edges of the measure

2.2.2 *Line Measure*

A line measure is one that has principal scale marks represented by two lines, holes or marks

2.2.3 *Composite Measure*

A composite measure is one that has principal scale marks which are respectively, an end surface or edge and a line, hole or mark

2.3 Supplementary Devices

Supplementary devices for length measure, such as one or more fixed or movable hooks, rings, handles tips, winding devices and verniers, are intended to facilitate and extend the utility of the measure

3 NOMINAL LENGTHS

3.1 Fabric or plastic tape measures shall be made in nominal lengths of 0 5 m 1 m 1 5 m, 2 m, 3m, 4m 5m or multiples of 5 metres, provided that the maximum nominal length shall not exceed 100 metres

NOTE — The nominal length of a fabric or plastic tape measure is the distance at the reference temperature of 20 C between the initial and terminal graduation lines when the tape measure is stretched in the wet or dry condition and without friction on a horizontal plane surface under a tension of 20 newtons The length so measured shall be equal within the limits of maximum permissible errors to the nominal length of the tape measure

4 MATERIAL

4.1 The materials used shall be adequately strong stable and resistant to atmospheric conditions under the normal conditions of use and shall comply with the following requirements

a) When ordinarily used at temperatures between ± 8 C of the reference temperature the variation in length of the tape measures shall not exceed the maximum permissible error.

b) When used with a change of ± 10 percent in the tension, the variation in length of the tape measure shall not exceed the maximum permissible error

4.2 Tape Measure of Nominal Length 0.5 m to 5 m

a) The tape measure may be made from a suitable fabric or plastic material.

b) The fabric shall be coated with suitable paints enamels or other suitable coating so as to give the tape measure a good finish All coatings shall be non-cracking and water resistant

4.3 Tape Measure of Nominal Length Above 5 m

4.3.1 The woven, metallic tapes shall be of yarn and metal wire in the warp and only yarn in the weft.

4.3.2 The glass fibre tapes shall be made of glass fibre placed in parallel and covered with resilient plastic.

4.3.3 If made from any other material, the tape measure shall satisfy the conditions specified in **4.1**.

5 CONSTRUCTION

5.1 General

5.1.1 Tape measures shall be well made, robust and carefully finished (*see* Fig. 1 to 5).

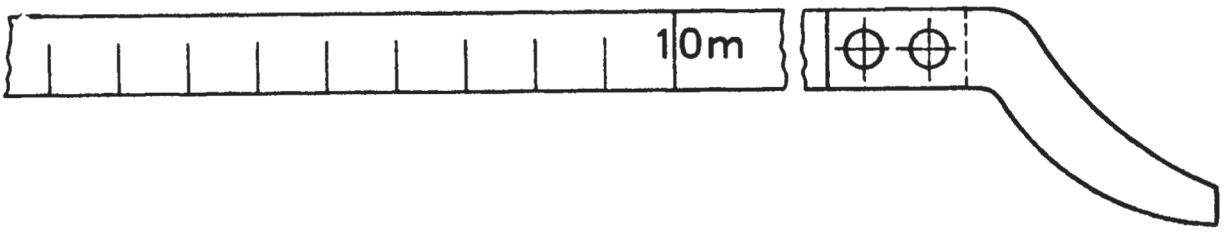

FIG. 1 END OF MEASURE

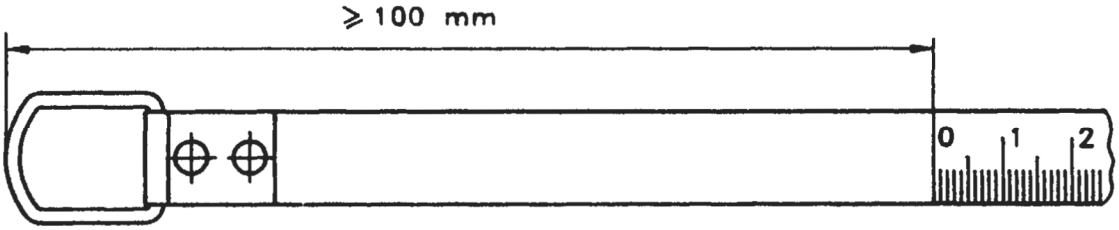

FIG. 2 MEASURE WITH ZERO AWAY FROM RING

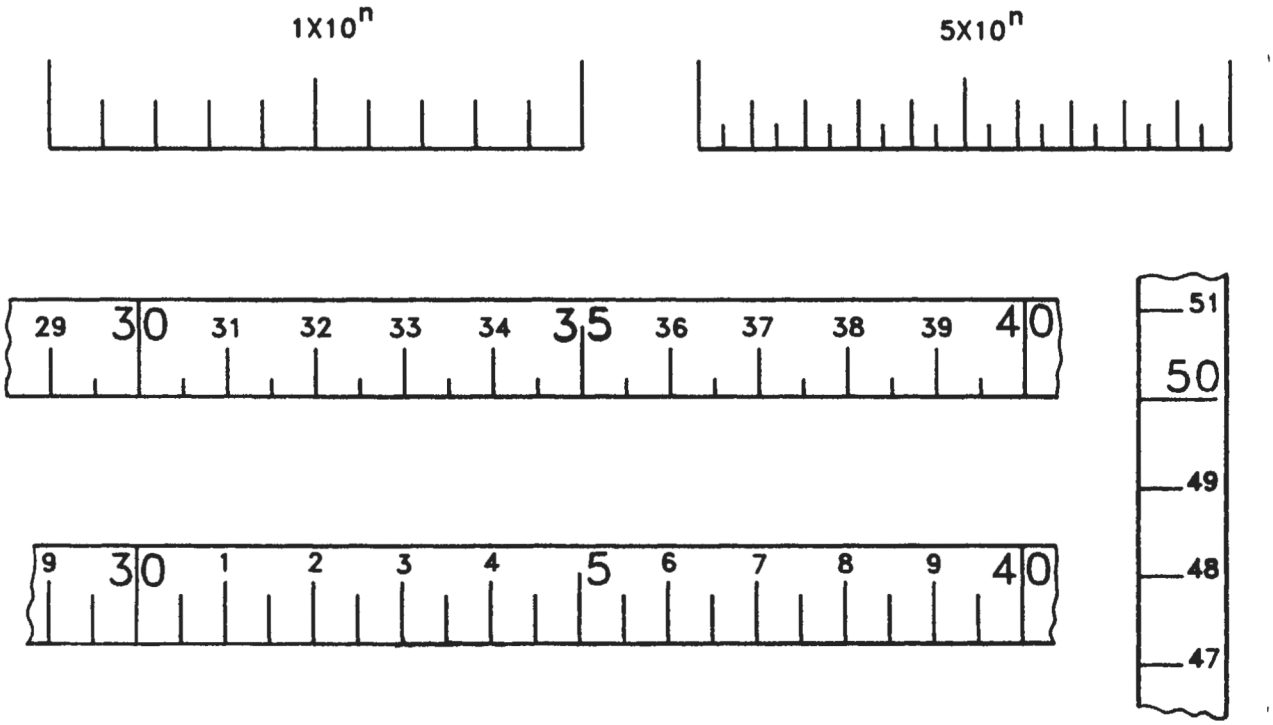

FIG. 3 GRADUATION LINES AND NUMBERING

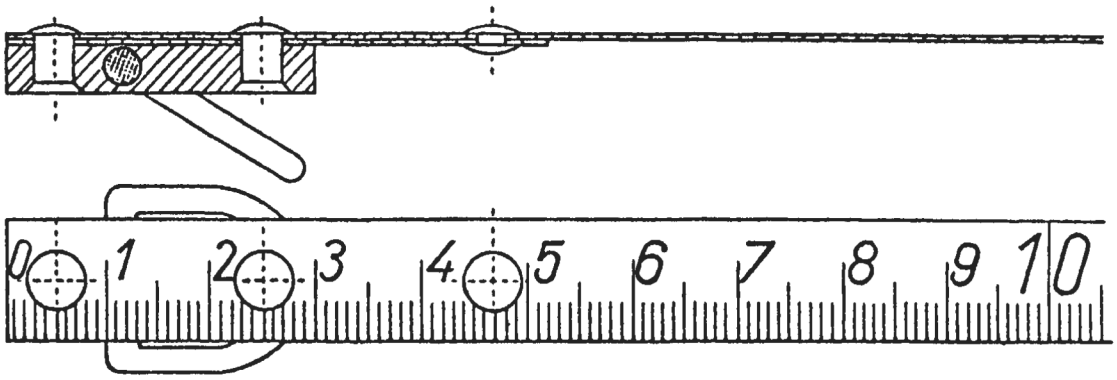

FIG. 4 MEASURE COMMENCING WITH ZERO

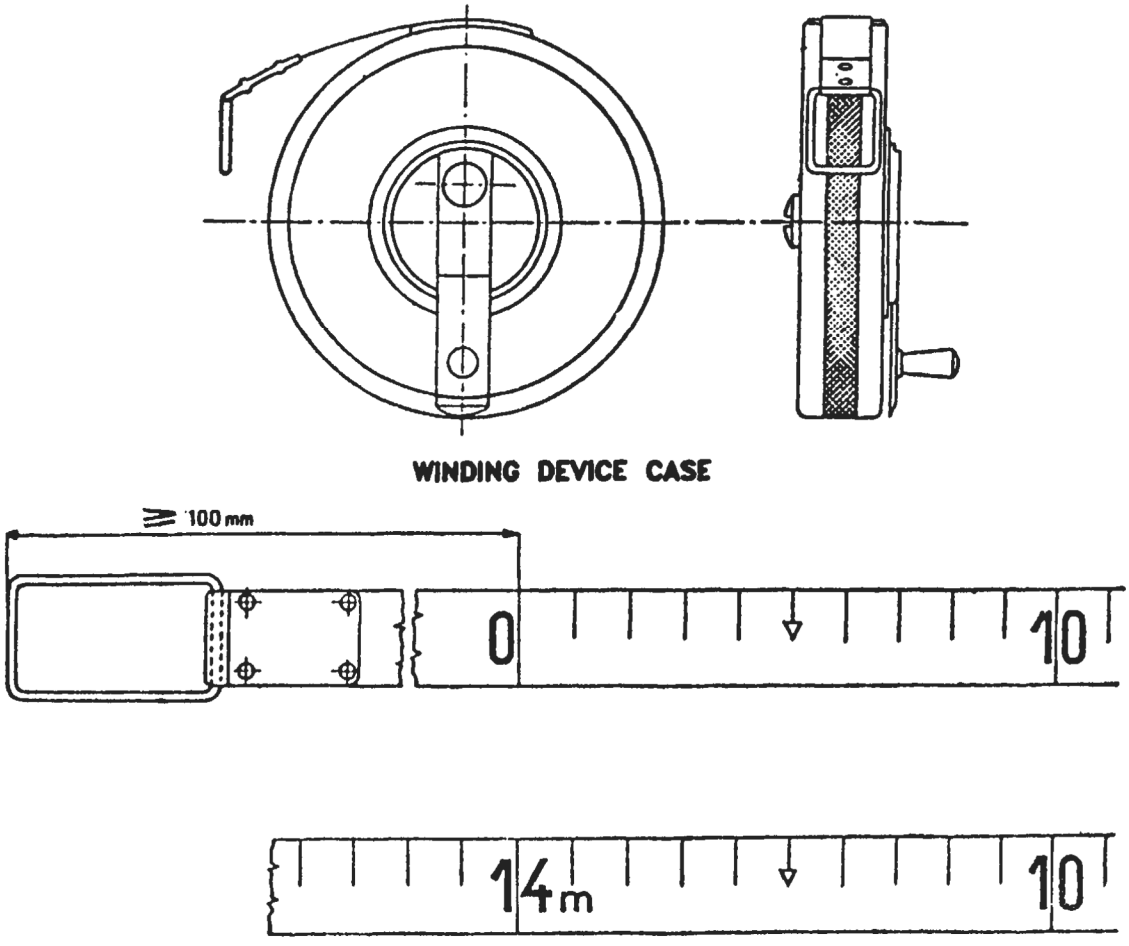

FIG. 5 LONG MEASURE OF FABRIC OR FIBRE GLASS AND CONTAINER

5.1.2 The cross section of the tape measures shall have such dimensions and shape that, under normal conditions of use it allows the tape measure to have the accuracy specified for its class.

5.1.3 Tape measures shall be so made that when they are stretched over a plain surface, their edges are practically straight and parallel.

5.1.4 The rings, winding devices or other device shall be attached to the tape in such a manner that they do not cause any inaccuracy or permanent deformation in the tape (*see* Fig. 5).

5.1.5 The tape shall be coated with a suitable primer of synthetic material over which one or more coats of flexible, high quality enamel shall be given. The

final top coat shall be of a varnish which will give the tape a good finish. All coating shall be non-cracking and water resistant.

5.2 Tape Measures of Nominal Length 0.5 m to 5 m

5.2.1 Tape measures of nominal length 0.5 to 5 m shall have a width of not less than 5 mm and not more than 25 mm. The tape shall have the thickness of not less than 0.3 mm and not more than 0.5 mm.

5.2.2 If not wound on a spool or in a case, both the ends of the tape measure shall be reinforced with plastic or metal strips of the same width as the tape measure, over a length of not less than 10 mm or more than 100 mm. (*see* Fig. 6)

5.3 Tape Measure of Nominal Length Above 5 m

5.3.1 The tape measures shall have a width of not less than 10 mm and a thickness between 0.3 and 0.6 mm.

5.3.2 A metal ring shall be securely attached to the outer end of each tape measure. The ring shall be securely fastened to the tape measure by a metal strip of the same width as the tape (*see* Fig. 2).

5.3.3 The outer end of the tape measure shall be reinforced over a length of not less than 100 mm by a strip of leather or other suitable material of the same width as the tape measure. The strip shall pass round the inner end of the ring and under the metal strip (*see* Fig. 2).

NOTE — This strip, besides serving as a protective device shall also be utilised for affixing the stamp of verification

5.3.4 The tape measure shall be rolled into a suitable container or wound on a winding device, made of metal, plastic, leather or other suitable material (*see* Fig. 5).

6 GRADUATIONS

6.1 Graduated scales shall be clear, regular and indelible. Graduation shall be carried out in such a way that reading is definite, easy and unambiguous (*see* Fig. 3) .

6.2 The value of the scale division shall take the form 1×10^n, 2×10^n or 5×10^n metres where the exponent "n" is a positive or negative whole number or zero.

The value of the main scale division shall not exceed:

- 1 cm for measures with a nominal length not greater than 2 m,
- 10 cm if the nominal length is greater than 2 m and less than 10 m,
- 20 cm if the nominal length is equal to or greater than 10 m and less than 50 m,
- 50 cm if nominal length is equal to or greater than 50 m.

6.3 Graduation lines shall be reasonably straight, perpendicular to the longitudinal axis of the tape measure and of uniform thickness and size throughout the length.

6.3.1 Graduation lines shall be so made that they form a clear and distinct scale and that their thickness shall satisfy the requirements of **6.9** to avoid inaccuracy in reading.

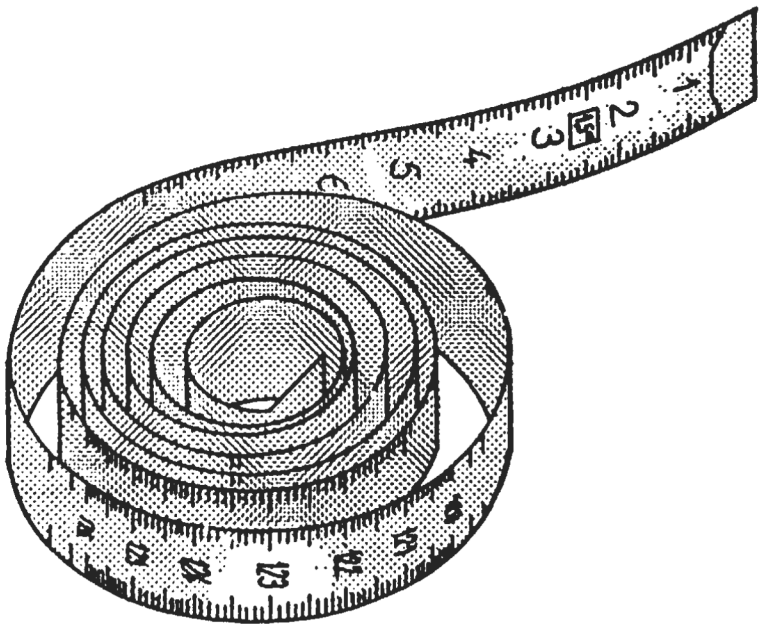

FIG. 6 FLEXIBLE FIBREGLASS AND PLASTIC TAPE MEASURE

6.3.2 The tape measure shall be graduated only in metric units and graduations or other indications showing or relating to units other than metric units shall not be made on any surface of the tape measure

6.4 Tape measures above 5 m to 100 m shall be graduated only on one side. Tape measures of 0 5 m to 5 m may be graduated on both sides (only metric scale).

6.5 The graduation lines, numbers and other markings shall be either in relief, engraved, typographically printed or made in any other suitable manner so as to satisfy the requirements specified in 10.3.

6.6 The zero of the scale may be located at the outer or inner edge of the ring or other device, or may also be located on the tape measure itself, at a length equal to or greater than:

a) 50 mm from the outer end of the ring or other device, in the case of tape measures of nominal length 0.5 m to 5 m.

b) 100 mm from the outer end of the ring or other device, in the case of tape measures of nominal lengths above 5 m

6.7 Tape measures of denominations 0.5 m to 5 m may be graduated throughout at every millimetre, every 5 millimetres or every 10 millimetres

a) The graduation lines at every 10 mm shall be marked in such a manner that there is no confusion between the 100 mm graduation lines and the millimetre or 5 mm graduation lines.

b) In the case of tape measures graduated at every 5 mm or 10 mm, not less than the first 100 mm shall be subdivided into millimetres

6.8 In the case of tape measures of nominal length above 5 m, every graduation line at 50 mm shall have the same length as the graduation line at 10 mm but may have an arrow at its end. This requirement shall not apply to tape measures graduated at every millimetre.

6.9 The thickness of the graduation lines shall not exceed 0.4 mm in the case of Class I and Class II tape measures, and 0.5 mm in the case of Class III tape measures.

6.10 In the case of tape measures of nominal length 0.5 m to 5 m, the graduation lines may have a length between one fourth and full width of the tape, depending upon convenience. In the case of tape measures of nominal length above 5 m, the length of the graduation lines may be as follows:

a) for millimetre graduation lines, about one-third of the width of the tape;

b) for 5 millimetre graduation lines, about half the width of the tape,

c) for 10 millimetre graduation lines, about two-thirds the width of the tape, and

d) for 100 millimetre graduation lines and for metre graduation lines as well as for the zero graduation lines, equal to the width of the tape

7 NUMBERING

7.1 General Requirements

7.1.1 The numerals shall be indicated clearly, uniformly and indelibly and shall be easily and unambiguously legible

7.1.2 The place, dimension, shape, colour and contrast of the numerals shall be suitable for the scale and the graduation lines to which they relate

7.1.3 The numerals shall be marked parallel to or perpendicular to the axis of the tape measure depending upon the intended manner of use of the measure

7.2 The following graduation lines shall be numbered

'10 mm, for tape measures of nominal length 0 5 to 5 m, and 100 mm, for tape measures of nominal length exceeding 5 m'

7.3 The metre graduation lines shall be numbered and accompanied by the symbol 'm'

NOTE — The abbreviations may be indicated in the regional script

7.4 In the case of the tape measures of nominal length of 0 5 m to 5 m, the height of the numerals shall be such as would facilitate the reading of the measurement without ambiguity

7.5 In the case of tape measures of nominal length 5 m and above, after the graduation line at one metre, every graduation line at 100 mm may be marked with an additional numeral, indicating the completed number of metres The numeral, if provided, may be located just above, below or in line with the numeral of the 100 mm graduation line The height of this numeral may be approximately half the height of the numerals indicating 100 mm

7.6 In the case of tape measures of nominal length 5 m and above, the height of the numerals, except those given in 7.5 may be

a) about 1/3 of the width of the tape, for 10 mm graduation lines,

b) about 1/2 of the width of the tape, for 100 mm graduation lines, and

c) about 2/3 of the width of the tape, for metre graduation lines

7.7 If tapes of 0 5 m to 5 m are contained in special container, such container may be marked with its dimension, for example, 50 mm, to facilitate measurement of internal dimensions

8 ACCURACY CLASSES AND MAXIMUM PERMISSIBLE ERRORS

8.1 Maximum Permissible Error at Initial Verification

8.1.1 At the time of initial verification, the maximum permissible error, under reference conditions and for a length demarcated by any two scale marks, is given by accuracy class by the following formulaes

Class I — Maximum permissible error equals (0 1 + 0 1 L) mm positive or negative,

Class II — Maximum permissible error equals (0 3 + 0 2L) mm positive or negative,

Class III — Maximum permissible error equals (0 6 + 0 4 L) mm positive or negative,

where

'*L*' is the value of the length in question, expressed in metres and rounded off to the nearest integral number of metres

8.1.2 The maximum permissible positive or negative error in the length *l* between the centre lines of two consecutive scale marks, and the maximum permissible difference between lengths l_1 and l_2 for two consecutive intervals, are specified in the following table for each accuracy class

Length l of Interval in Question	*Maximum Permissible Error or Difference in Millimetres for Accuracy Class*		
	I	II	III
$l \leq 1$ mm	0 1	0 2	0 3
1 mm $< l \leq$ 1 cm	0 2	0 4	0 6
1 cm $< l \leq$ 1 dm	0 3	0 5	0 9

8.2 Maximum Permissible Error for Measures in Service

The maximum permissible error for measures in service is equal to twice the maximum permissible error at the time of initial verification, as specified in **8.1.**

8.3 Reference Conditions

Maximum permissible errors are subject to the following reference conditions

8.3.1 A reference temperature of 27°C may be used Under exceptional circumstances, other reference temperatures may be used in certain specific applications

8.3.2 During tests, length measures for which a tension is specified shall be supported with negligible friction on a horizontal surface over the total length under test and shall be stretched out by a tension of 20 newtons on the measure

8.4 Tape measures of nominal length 0 5 m to 5 m shall belong to accuracy class II or Class III

8.5 Tape measures of nominal length above 5 m to 100 m shall belong to accuracy Class I, Class II or Class III

9 CASE AND WINDING DEVICE

9.1 Case

9.1.1 Unless otherwise specified by the purchaser tapes of denomination 5m and above shall be supplied in a case, made of leather or corrosion-resisting metal or a metal with a corrosion-resisting finish or high tensile polythene fitted with a winding device

9.1.2 If it is not wholly made of leather, the case shall not be less than 1 2 mm thick If the case is wholly made of leather, the thickness of the leather used shall be at least 3 mm

9.1.3 The leather used shall be genuine leather weighing not less than one kilogram per square metre and with a minimum breaking strength of 20 kg/cm². The seams in the leather cover shall be butted securely and neatly sewn, 2 to 3 stitches per centimetre with thread having a breaking strength of not less than 4 kg

9.1.4 If metal case is used, it shall be covered with a suitable leather leather-cloth or plastic material as may be specified by the purchaser

9.1.5 The opening in the case for the tape shall be provided with a durable eye and with rollers for bearing on each side of the opening

9.2 Winding Device

9.2.1 *Handle*

The handle for the winding device shall be suitable for winding the tape on the reel It shall fold against the reel and shall have a crank length of not less than 25 mm

9.2.2 *Reel*

The reel shall be of robust construction and it shall rotate freely

10 TESTS

The tests, specified in **10.1** to **10.6** shall be carried

out on selected samples of tapes, the samples being drawn preferably from regular production line

10.1 Bend Test

A piece of tape, about 15 cm long, shall be folded across its length and the two ends joined or held together in a convenient manner The loop shall be placed in a parallel jaw vice or other suitable adjustable device The jaws shall be closed gradually until the distance between them is 6 mm The jaws shall then be opened and the joined ends of the tape released The operation shall be repeated, the tape being folded in the opposite direction The tape shall be subjected to 100 such reversals, due care being taken to ensure that the centre-line of the bend remains the same so as to ensure that the effect of reversals is along the same line The tape shall be deemed to have passed the test, if it does not break into two pieces at the end of the test

10.2 Permanent Set Test

A length of tape, say a metre, shall be kept stretched under a load of 5 kg for a period of one minute and the length shall be measured after the release of the load There shall be no permanent set

10.3 Coating Stability Test

The finished tape shall be first bent flat on itself and then bent reversely through 360° This operation shall be repeated five times and at the end of the test, the tape enamel and numerals shall not show any sign of cracking

10.4 Sticking Test

Two pieces of the finished tape, each 10 cm long, shall be placed together, flat face to flat face, on a level and smooth surface A uniform load of 50 kg shall be applied to the entire surface of the tape After the removal of the load, the two pieces shall separate easily and not stick together

10.5 Print Stability Test

A piece of the finished tape shall be placed in water at room temperature for 24 hours The tape shall then be placed flat on a piece of paper with the printed side up and the printed matter shall be rubbed hard with the thumb a few times and it shall not get rubbed off

10.6 Water Proofing Test

A strip of the finished tape, 15 cm long, shall be cut and its cut ends sealed with a water proofing composition or wax so that the ends are blocked completely The sample shall be weighed to the nearest milligram and kept immersed in water at room temperature for a period of 24 hours The sample shall then be removed and placed between two sheets of fresh blotting paper and the excess water blotted off with another piece of blotting paper The sample shall be kept in shade in a room for about half an hour and then reweighed The difference in weight, expressed as a percentage of the initial weight, will give the percertage of water absorption

10.6.1 The water absorpuon, when tested in the manner described above, shall not exceed 6 percent by weight

11 MARKING

11.1 Tape Measures of Nominal Length 0.5 m to 5 m

11.1.1 The tape measures and the case or container, if provided shall be marked at a suitable place with the following marking

a) nominal length in metres,

b) manufacturers' name or trade mark or both and

c) class of accuracy II or III (in an oval)

11.2 Tape Measures of Nominal Length above 5 m

11.2.1 The tape measure and the case or container or other device, where provided shall be marked near the zero graduation line and on the container, case or other device with the following markings

a) nominal length in metres,

b) manufacturer's name or trade mark or both, and

c) class of accuracy I, II or III (in an oval)

11.3 The inscriptions shall be clearly visible and legible

11.4 Advertising inscriptions, if made, shall be carried out in such a manner that they do not intrude in any way with the use of the tape measure

11.5 Standard Marking

The use of the Standard Mark is governed by the provisions of *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

12 PROVISION OF STAMPING

12.1 The stamp of verification shall be affixed on the metal strip, plastic or leather provided at the beginning of the tape measure

Bureau of Indian Standards

BIS is a statutory institution established under the *Bureau of Indian Standards Act*, 1986 to promote harmonious development of the activities of standardization, marking and quality certification of goods and attending to connected matters in the country.

Copyright

Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Handbook' and 'Standards : Monthly Additions'.

This Indian Standard has been developed from Doc : No. LM 06 (0280)

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

BUREAU OF INDIAN STANDARDS

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002
Telephones : 323 01 31, 323 94 02, 323 33 75

Telegrams: Manaksanstha
(Common to all offices)

Regional Offices: — Telephone

Central : Manak Bhavan, 9 Bahadur Shah Zafar Marg, NEW DELHI 110002 — 323 76 17, 323 38 41

Eastern : 1/14 C. I. T. Scheme VII M, V. I. P. Road, Maniktola, CALCUTTA 700054 — 337 84 99, 337 85 61, 337 86 26, 337 86 62

Northern : SCO 335-336, Sector 34-A, CHANDIGARH 160022 — 60 38 43, 60 20 25

Southern : C. I. T. Campus, IV Cross Road, CHENNAI 600113 — 235 02 16, 235 04 42, 235 15 19, 235 23 15

Western : Manakalaya, E9 MIDC, Marol, Andheri (East), MUMBAI 400093 — 832 92 95, 832 78 58, 832 78 91, 832 78 92

Branches : AHMADABAD. BANGALORE. BHOPAL. BHUBANESHWAR. COIMBATORE. FARIDABAD. GHAZIABAD. GUWAHATI. HYDERABAD. JAIPUR. KANPUR. LUCKNOW. NAGPUR. PATNA. PUNE. THIRUVANANTHAPURAM.

Printed at New India Printing Press, Khurja, India