RESISED TEST MANUAL FOR FABRIC OR PLASTIC TAPE MEASURE

1.0 GENERAL

(a) This test manual deals with fabric or plastic tape measures which are used for measurements where the use of rigid length measures is not convenient or practicable.

(b) Tape measure of 0.5m to 5m, made of materials specified in clause 4(b), are intended to be used for measurements required in the tailoring trade, anatomical measurements or household measurements. Tape measures of 5m and above made of materials specified in clause 4(c) are intended to be used for measurements of buildings, roads, timber and timber products and for other similar measurements but not for measurement of land, storage tanks, fermentation fats and other similar measurements.

2.0 CLASSES OF ACCURACY

Fabric or plastic tape measures shall be divided into three classes of accuracy Namely; Class I, Class II and Class III, in accordance with their accuracy.

3.0 NOMINAL LENGTHS

Fabric or plastic tape measures shall be made in nominal lengths of 0.5m, 1m, 1.5m, 2m, 3m, 4m, 5m or multiples of 5 meters, provided that the maximum Nominal length shall not exceed 100 meters.

NOTE: The nominal length of a fabric or plastic tape measure is the distance at the reference temperature of 20 ºC 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 an extension 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.

4.0 MATERIAL

(a) 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:

- (i) When ordinarily used at temperatures between ± 8 ºC of the reference temperature, the variation in length of the tape measure shall not exceed the maximum permissible error;
- (ii) When used with a change of ± 10 per cent in the tension, the variation in length of the tape measure shall not exceed the maximum permissible error.

(b) Tape measure of nominal length 0.5m to 5m shall be made of the following material requirements:-

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

(ii) 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.

(c) Tape measure of nominal length above 5m material requirements:-

(i) If made of fabrics, the fabric may be reinforced length-wise with rust-proof and rigid wires of metal or other equivalent material.

(ii) If made from plastic materials, the tape measure shall be reinforced length-wise by means of rust-proof and rigid wires of metal or glass fibers.

(iii) If made from any other material, the tape measure shall satisfy the conditions specified in clause 3(a).

5.0 MANUFACTURE

(a) General:-

(i) Tape measure shall be well made, robust and carefully finished.

(ii) 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.

(iii) Tape measures shall be so made that when they are stretched over a plane surface their edges are practically straight and parallel.

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

(b) Tape measures of nominal length of 0.5m to 5m:-

(i) Tape measures of nominal length of 0.5m to 5m shall have a width of not less than 5mm and not more than 25mm.

(ii) 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 10mm or more than 10mm.

(iii) If wound on a spool or in a case, the tape measure shall have a metal ring or other device securely attached to the other end of the tape measure. A device for retraction or winding of the tape shall be provided.

(c) Tape measure of nominal length above 5m:-

(i) The tape measure shall have a width of not less than 10mm and a thickness between 0.3mm and 0.6 mm.

(ii) 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.

(iii) The outer end of the tape measure shall be reinforced over a length of not less than 100mm 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.

NOTE: The strip, besides serving as a protective device shall also be utilized for affixing the stamp of verification.

(iv) 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.

6.0 GRADUATIONS

(a) General requirements:-

(i) Graduation lines shall be clear, uniform, indelible and so made as to ensure easy and unambiguous reading.

(ii) The value of the graduations shall be of the form 1x10n, 2x10n, or 5x10n, the exponent "n" being positive or negative whole number or zero. The value of the graduation, however, shall not exceed: 1cm on Measures of nominal length less than or equal to 2cm; 10cm on Measures of nominal length more than 2m, but less than 10m; 20cm On measures of nominal length more than 10m, but less than 50m; 50cm on measures of nominal length equal to or more than 50m.

(iii) Graduation lines shall be reasonably straight, perpendicular to the axis of the tape measures and of uniform thickness throughout their length.

(iv) Graduations lines shall be so made that they form a clear and distinct scale and their thickness do not cause any inaccuracy of reading.

(v) 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.

(b) Tape measures of nominal length 0.5m to 5m:-

(i) The zero graduation line may be located at the outer end of the ring or other device or may commence on the tape itself at a length equal to or greater than 50mm from the outer end of the ring or other device.

(ii) The tape measures may be graduated throughout at every millimeter or every 5mm.

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

(iv) The tape measures may be graduated on one side or both the sides. If the tape is graduated on one side, the manufacturer's name, trade mark, advertisement or other similar matter may be printed on the un-graduated side of the tape measure.

(c) Tape measures of nominal length above 5m:-

(i) The zero graduation line may be located at the outer end of the metal ring or on the tape itself, at a length equal to or greater than 100mm from the outer end of the ring.

(ii) The tape measure may be graduated throughout at every millimeter, every 5 millimeter or every 10 millimeters.

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

(iv) The graduation lines at every 10m shall have a length approximately half the width of the tape.

(v) Every graduation line at 50mm shall have the same length as the graduation line at 10mm but may have an arrow at its end. This requirement shall not apply to tape measures graduated at every millimeter.

(vi) The zero graduation line, the graduation lines at every 100 millimeters and at every meter shall have a length equal to the width of a tape.

7.0 NUMBERING

(a) General requirements:

(i) The numerals shall be indicated clearly uniformly and indelibly end shall be easily and unambiguously legible.

(ii) The places, dimensions, shape, colour and contrast of the numerals shall be suitable for the scale and graduation lines to which they relate.

(iii) 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.

(b) On tape measures of nominal length of 0.5m to 5m:-

(i) Every graduation line at 10mm shall be marked with the complete number of centimeters and [Explanation – The graduation number marked may be, for example 122 and not 22 after completion of one metre.

(ii) The height of the numerals shall not exceed two-thirds the width of the tape measures.

(d) On tape measures of nominal length above 5m:-

(i) The graduation lines at every 100mm and at every meter shall be numbered. The numerals shall have a height of not more than two-thirds of the width of the tape.

(ii) The metre graduations shall be accompanied by the symbol 'm'

(iii) After the graduation line at one meter, every graduation line at 100mm may be marked with an additional numeral indicating the completed number of metres. This numeral, if provided, may be located just above, below or in line with the numeral of the 100mm graduation line. The height of the numeral may be approximately half the height of the numerals indicating 100mm.

8.0 MAXIMUM PERMISSIBLE ERROR

(a) On verification, under the conditions specified in clause 2, the error on the length between the axis of any two graduation lines shall not exceed:

- For Class I $\pm (0.1 + 0.1L)$ mm
- For Class II $\pm (0.3 + 0.2L)$ mm, and
- For Class III $\pm (0.6 + 0.4L)$ mm;

Where L is the length between the two graduation lines concerned, expressed in metres, rounded off to the next higher whole number of metres.

(b) The maximum permissible error on tape measures on inspection shall be twice that specified for verification, the methods of verification remaining unchanged.

(c) Tape measures of nominal length of 0.5m to 5m shall belong to accuracy Class II or Class III.

(d) Tape measures of nominal length above 5m shall belong to accuracy Class I, Class II or Class III.

9.0 MARKINGS

(a) Tape measures of nominal length of 0.5m to 5m: The tape measures and the case or container, if provided shall be marked at a suitable place with the following markings:-

(i) Nominal length in metres;

(ii) Manufacturer's name or trademark or both;

(iii) Class of accuracy II or III in an oval;

(b) Tape measures of nominal length above 5m: 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:

(i) Nominal length in metres;
(ii) Manufacturer's name or trade mark or both;
(iii) Class of accuracy: I, II or III in an oval.

(c) The inscriptions, shall be clearly visible and legible.

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

10.0 SEALING

The stamp of verification shall be affixed on the metal, plastic, leather or other strip provided at the beginning of the tape measures.