L.N. 406 of 2002

THE METROLOGY ACT
ACT NO. XXV OF 2002

Material Measures of Length Regulations, 2002

IN exercise of the powers conferred by article 19 of the Metrology Act, the Malta Standards Authority has made the following regulations:-

Commencement and Citation

1. (1) The title of these regulations is the Material Measures of Length Regulations 2002.

(2) These regulations shall come into force on such date or dates as the Authority may by notice in the Gazette appoint and different dates may be so appointed for different purposes and different provisions of these regulations.

Definitions. Cap. 419.

2. All the definitions of the Malta Standards Authority Act shall apply.

Scope

3. These regulations shall apply to the material measures of length specified in the Annex.

Instruments for measuring length with EEC marks etc.

4. (1) Those instruments for measuring length which may bear EEC marks and symbols are described in the Annex.

(2) They shall be subject to EEC pattern approval and shall be submitted to EEC initial verification.

(3) The placing on the market or entry into service of material measures of length bearing the EEC pattern approval symbol and the EEC initial verification mark may not be refused, prohibited or restricted.

ANNEX

1. Definitions

1.1. Material measures of length hereinafter called "measures of length" are instruments comprising scale-marks whose distances are given in legal units of length.

1.2. The "nominal length" of a measure of length is the length by which that measure is designated.

1.3. The principal scale-marks are the two marks whose distance apart represents the "nominal length" of the measure.

1.4. The scale of the measure of length is formed by the principal scale-marks and the other marks.

1.5. A measure of length is described as:

1.5.1. - an end measure when the principal scale-marks are formed by two surfaces;

1.5.2. - a line measure when the principal scale-marks are formed by two lines, holes or marks;

1.5.3. - a composite measure when one of the principal scale-marks is a surface and the other a line, hole or mark.

2. Materials

Measures of length and their supplementary appliances shall be made of materials which are sufficiently durable, stable and resistant to environmental influences under normal conditions of use.

The qualities of the materials used must be such that:

2.1. In normal use at temperatures not more than 8 °C above or below the reference temperature, variations in length are not greater than the maximum permissible errors.

2.2. For measures which have to be used under a specified tractive force, an increase or decrease of 10 % in that force does not produce a variation in length exceeding the maximum permissible error.

3. Construction

3.1. Measures of length and their supplementary appliances shall be well and solidly constructed and carefully finished.

3.2. The transverse section of measures of length shall be of such dimensions and shape that, under normal conditions of use, it enables measurements to be made with the accuracy required for the class of accuracy to which the measure in question belongs.

3.3. The terminal surfaces of end measures of length shall be flat. These terminal surfaces and the lines must be perpendicular to the longitudinal axis of the measure.

3.4. The terminal surfaces of end or composite measures, made of wood or other material of durability equal to or less than that of wood shall be formed by a band or tip which is resistant to wear and impact and suitably fixed to the measure.

3.5. Supplementary appliances, such as one or more fixed or movable hooks, rings, handles, plates, pins, tongues, winders, or veniers, which facilitate the use of the measure and extend its use, are permissible on condition that they cannot cause confusion. They shall be designed and fixed to the measure in such a way that in normal conditions of use, they cannot in practice increase the inaccuracy of measurement.

3.6. Tape measures shall be made so that when the tape is stretched out on a flat surface its edges are practically straight and parallel.

3.7. The winding appliances of tape measures shall be made in such a way that they do not cause any permanent deformation of the tape.

4. Graduation and numbering

4.1. Along their nominal length, measures of length shall carry clear, regular and indelible graduation and numbering, so as to enable a sure, simple and unambiguous reading to be made. However, some non-numbered scale marks not exceeding the number of scale marks between two consecutive numbered scale marks on the measure, may extend beyond the principal scale mark at the end of the measure.

4.2. The value of the scale interval shall be in the form 1×10^n, 2×10^n or 5×10^n metres, the power of "n" being a positive or negative whole number or zero.

It shall, at most, be equal to:

- 1 cm on measures of a nominal length less than or equal to 2 mm,
- 10 cm if the nominal length is over 2 m and less than 10 m,
- 20 cm if the nominal length is over or equal to 10 m and less than 50 m,
- 50 cm if the nominal length is over or equal to 50 m.

However these values may be exceeded for specific uses subject to justification at the time of requesting pattern approval and the indication on the measure of the specific use for which it is reserved.

4.3. When the scale marks are lines, these shall be straight, perpendicular to the axis of the measure of length and all of the same thickness, constant throughout their length. The length of the lines shall be related to the corresponding unit of measurement. The

lines shall be such that they form a distinct and clear scale and that their thickness does not cause any inaccuracy of measurement.

4.4. Certain sections of the scale, especially towards the ends, may be subdivided into decimal submultiples of the scale-interval adopted for the whole measure. In that case, the thickness of the lines may be less in the areas of reduced scale-intervals than in the rest of the measure.

4.5. The scale-marks may also be formed by holes if the value of the scale-interval is above or equal to one centimetre, or by other marks if the value of the scale-interval is above or equal to one decimetre, provided that these marks ensure a sufficiently exact reading, taking into account the class of accuracy to which the measure belongs.

4.6. The numbering may be continuous or repetitive. In the case referred to in item 4.4 the numbering in the areas of reduced scale-interval may be different from that of the rest of the measure. The position, size, shape, colour and contrast of the numbers shall be adapted to the scale and to the scale-marks to which they relate.

Whatever the value of the scale-interval fixed in item 4.2 the numbered scale-marks shall be numbered in metres, in decimetres, in centimetres or in millimetres without indication of the corresponding symbol.

The number of numbered scale-marks shall be such that the reading is not ambiguous. When the numbering unit is other than the metre, the metre scale-marks may however be numbered in metres. The numbers of the metres shall then be followed by the symbol "m".

In addition, the number of preceding metres may be repeated in the same way in front of the other numbered scale-marks.

When the value of the interval of a scale with lines is in the form of 2×10^n and not less than 2 centimetres, all the scale-marks shall be numbered.

4.7. When a measure carries more than one scale, the scale-intervals may be different, and the numbering may increase in the same direction or the opposite direction.

5. Nominal length

5.1. The nominal length of the measures shall be one of the following values : 0.5, 1, 1.5 , 2, 3, 4, 5, 6, 7, 8, 9 m or a complete multiple of 5 m.

5.2. However, other values may be authorized for specific uses provided that the need to use a measure of such nominal length is justified at the time of the request for pattern approval, and that the specific use for which it is reserved is indicated on the measure.

5.3. Some of the nominal lengths in subparagraph 5.1 are not allowed for the measures referred to in paragraph 9.4.2.

6. Inscriptions

6.1. The following inscriptions shall appear on measures of length:

6.1.1. Inscriptions, compulsory in all cases:

6.1.1.1. nominal length;

6.1.1.2. manufacturer's identification mark or his trade name;

6.1.1.3. indication of the class of accuracy : I, II or III;

6.1.1.4. EEC pattern approval sign.

6.1.2. Inscriptions, compulsory in certain cases:

6.1.2.1. reference temperature if it is other than 20 °C;

6.1.2.2. tractive force;

6.1.2.3. specific use for which the measure is reserved in the cases provided for in points 4.2 and 5.2.

6.2. The nominal length, the tension and the temperature shall be expressed in units of measurement as indicated in Schedule 1 of the Metrology Act ,2002 ,relating to units of measurement, or in one of their decimal multiples or submultiples, followed by the corresponding legal symbol.

6.3. All these inscriptions shall be given visibly and legibly from the beginning of the measure.

However, in agreement with the Authority, certain inscriptions may appear on an integral part of the instrument. In this case, the EEC pattern approval certificate shall state where these inscriptions are to be placed.

Furthermore, where the width of the measure of length does not enable the EEC pattern approval sign to appear legibly, that sign may appear, notwithstanding the provisions of point 3.1 of Annex I to the Measuring Instruments Regulations, 2002, for both measuring instruments and methods of metrological control, and in accordance with point 3.5 of this Annex, in the form of the following signs, arranged in succession:

(a) the stylized letter 'e',
(b) M, distinguishing Malta when Malta would have granted EEC pattern approval,
(c) The last two digits of the year of EEC pattern approval,
(d) The reference number of the EEC pattern approval (e.g.e F 75 5435)

6.5. In addition, measures may bear other details of a non-metrological nature otherwise laid down by regulation or authorized by the competent national authority.

6.6. If the inscriptions are not in code, they shall be expressed in the official languages of the Member States of destination.

6.7. Advertising inscriptions may appear on measures of length provided that their positioning satisfies the provisions laid down in point 6.8.

6.8. The inscriptions, including advertising inscriptions, shall be arranged in such a way that they in no way interfere with the use of the instrument as a measure. The obligatory inscriptions, with the exception of the EEC pattern approval sign, and the location of advertising inscriptions shall appear on the model which is the subject of the EEC pattern approval.

7. Maximum permissible errors

The measures of length defined in these regulations shall be divided into three classes, designated I, II and III, according to their degree of precision.

7.1 The maximum permissible error, positive or negative error,

(a) on the nominal length; and
(b) on the distance between any two non-consecutive scale marks,

shall be expressed as a function of the length in question by a formula in the form (a + b L) millimetres in which:

- L is the length in question, rounded up to the next whole metre above;
- a and b are coefficients fixed for each class of accuracy according to the following table:

Position Class	a	b
I	0.1	0.1
II	0.3	0.2
III	0.6	0.4

7.2.

7.2.1 The maximum permissible error, plus or minus, on the length i of the intervals not exceeding 1 cm shall be fixed for each class of accuracy according to the following table:

Length i of the Interval in question	Maximum Permissible Error (in mm) For class of accuracy		
	I	II	III
i ≤ 1mm	0.1	0.2	0.3
1mm < i ≤ 1 cm	0.2	0.4	0.6

In the case of intervals exceeding 1 cm, the maximum permissible error shall be expressed as a function of the length of the interval by the formula (a + bL) mm, where the values of the parameters a and b are equal to those given in point 7.1 and where L is the length in question, rounded up to the next whole metre above.

7.2.2. The maximum permissible difference between the length i of two consecutive intervals not exceeding 1 cm shall be fixed for each class of accuracy according to the following table:

Length i of the Interval in question	Maximum Permissible Error (in mm) For class of accuracy		
	I	II	III
i ≤ 1mm	0.1	0.2	0.3
1mm < i ≤ 1 cm	0.2	0.4	0.6

In the case of intervals exceeding 1 cm, the maximum permissible difference between the lengths i of two consecutive intervals shall be expressed as a function of the length of the interval by the formula (a + bL) mm, as defined in point 7.2.1.

7.3. However, for an end or composite measure of length, the maximum permissible error, plus or minus, on the length of the terminal interval bounded by a surface shall be increased:

- by 0.1 mm for measures of class I;
- by 0.2 mm for measures of class II;
- by 0.3 mm for measures of class III.

Moreover, the provisions set out in points 7.1 and 7.2.2. do not apply:

- when one of the non-consecutive scale-marks as referred to in point 7.1 (b) is formed by a surface, and
- when one of the two consecutive intervals as referred to in point 7.2.2. is a terminal interval bounded by a surface.

7.4. The maximum permissible error for measures in service shall be equal to twice the maximum permissible error in the initial verification by the Authority.

7.5. The maximum permissible errors shall be subject to the following reference conditions:

7.5.1. The reference temperature shall normally be 20 °C. However, for certain measures specified in item 9 below, a different reference temperature may exceptionally be adopted.

7.5.2. Measures of length for which a tractive force is indicated in item 9 below, shall undergo tests, sustained over the whole length under inspection, in practice without friction, on a horizontal plane and under the tractive force indicated on the measure.

8. Verification marks

Every measure of length shall be made so that it can accommodate the verification marks laid down by the Measuring Instruments Regulations ,2002 both measuring instruments and methods of metrological control. A place near the beginning of the measure shall be provided for this purpose on the measure itself or on an integral additional device.

8.1 A place must be provided near the beginning of the measure of length itself or on an additional fixture to permit the Authority initial verification marks to be affixed.

8.2 The marks must be affixed in accordance with the provisions of point 3.1 in Annex II to the Measuring Instruments Regulations .

8.3 However, by derogations from point 3.1, the EEC initial verification mark may consist of the lower case letter "e" in a hexagon, the letter "e" containing in its upper half the upper-case letter identifying the initial State in which the EEC initial verification took place and in its lower half the year of verification. An example of the mark is shown at point 12.

8.4. The choice of one or the other form of mark is left to the discretion of the department responsible for EEC initial verification.

9. Different kinds of measures of length referred to by these regulations

9.1. End, line or composite tape measures made of fiberglass and plastics.

Nominal length between 0.5 and 100m.

The tractive force, of about 20 N, shall be shown on the measure.

The free ends of end and composite measures shall be provided with a band or tip resistant to wear.

These measures shall belong to class of accuracy I, II, and III.

9.2. Measures made in one piece, rigid or semi-rigid in metal or other material.

Nominal length between 0.5 and 5m.

The reference temperature may, in certain cases, be other than 20°C.

These measures also include dipsticks used for checking the level of liquids.

The end of a rigid dipstick shall be provided with a butt or tip resistant to impact and wear. It shall not cause sparking on impact.

These measures shall belong to class of accuracy I and II.

9.3. Folding measures made of metal or other material.

Nominal length between 0.5 and 5 metres.

The parts shall have equal lengths between joints.

Their jointing and their alignment in the open position shall be ensured by an effective device so constructed as not to cause an additional error at the joint exceeding 0.3 mm, for measures in classes of accuracy I and II and 0.5 mm for measures in class III.

These measures shall belong to classes of accuracy I, II or III.

9.4. Steel tape measures

9.4.1. End, line or composite measures on a winder.

Nominal length of between 0.5 and 10 metres; the blades of measures between 5 and 10 m shall be of a cambered cross-section.

These measures may be contained in a case, one of whose dimensions may be included in the part used for measuring, particularly for measuring internal dimensions;
the free end of these measures shall be provided with a fixed or sliding hook or tongue.
These measures shall belong to class of accuracy I or II.

9.4.2. End or line measures, designed for measuring lengths greater than the nominal length of the measure.

Nominal length : 5, 10, 20, 50, 100 or 200 metres.

The tractive force, of about 50 N, shall be shown on the measure.

These measures shall be equipped with handles or rings at the two ends.

If the handles are included in the nominal length, they shall be constructed in such a way that their jointing does not introduce any inaccuracy of measurement.

These measures shall belong to classes of accuracy I or II.

9.4.3. Line or composite measures on a winder not designed for the measuring of lengths greater than the nominal length.

Nominal length between 5 and 200 metres.

The tractive force, of about 50 N, shall be shown on the measure.

The free end shall include a handle or ring or hook which shall not be included in the nominal length.

These measures shall belong to classes of accuracy I or II.

9.4.4. Composite dip-tapes with sinkers, used for checking the level of liquids.

Nominal length between 5 and 50 metres.

The reference temperature may, in certain cases, be other than 20 °C.

The tractive force, sufficient to stretch the tape correctly, must be shown on the measure.

This tractive force must be shown on the measure. This tractive force shall be equal to the weight of the sinker. The sinker must bear an indication of its mass.

The principal scale-mark, beginning the scale, shall be constituted by the base of a sinker of a sinker of appropriate shape, sufficiently heavy to extend the tape correctly and shall be made of a material not liable to cause sparking on impact.

The sinker shall be attached to the tape in a fixed or detachable way so that this attachment or jointing does not introduce any inaccuracy of measurement.

The entire length of the tape shall be graduated in millimetres and shall continue on one flat side of the sinker.

The other end of the measure may be equipped with a winder.

These measures shall belong to the classes of accuracy I or II.
However, the maximum permissible error of the instrument in position for use with the sinker shall never be less than 0.6 mm.

10. EEC pattern approval and EEC initial verification

EEC pattern approval and EEC initial verification of material measures of length shall be carried out in accordance with the procedure laid down in the Measuring Instruments Regulations ,2002.

10.1 EEC pattern approval examination

Apart from the study documents, the examination shall consist of a check to ensure that the pattern submitted is in conformity with points 2,3,4,5,6 (except for point 6.4), 7,8 and 9

10.2 Initial verification checks

10.2.1 The initial verification checks shall be carried out either on all the measures of length submitted or on lots composed of measures in accordance with point 11.

10.2.2 The initial verification checks shall consist of a visual inspection of the measure of length to ensure its conformity with the approved pattern; this concerns in particular the provisions of points 3.6, 4.1 and 4.3

10.2.3 It also has to be verified that the measure of length complies with the requirements concerning the maximum permissible errors for the nominal length with due regard, where appropriate, to the provisions of point 9.5.

10.2.4. In addition, at five different places randomly distributed over the measure of length, a check shall be made of:

- The distance between two non-consecutive scale marks,
- The length of the interval,
- The difference between the length of two consecutive intervals,

in order to verify their compliance with the provisions of points 7.1 (b), 7.2.1. and 7.2.2. with due regard, where appropriate, to the provisions 7.3. and 9.3.

Where the results of the inspection justify, the competent department may reduce or increase the number of checks.

10.2.5.All the checks mentioned above shall be carried out under the reference conditions specified at point 7.5.

11. Statistical check applied as an initial verification check

When the measures of length are manufactured in series and the person responsible for submitting them for initial verification states that they have already been adequately inspected, at his request the lots submitted shall undergo a statistical check by attributes under the following conditions.

11.1 General

11.1.1. Lot

Lots are made up of measures of length which:

- Are of the same pattern,
- Belong to the same precision class,
- Are manufactured by the same process.

The size of the lot is the number of measures of length it contains. The maximum lot size for initial verification is 10 000 units.

11.1.2 Sample

A same is made up of measures of length selected at random from a lot. The number of measures of length in the sample is termed the sample size.

11.1.3. Statistical check by attributes

A statistical check by attributes is an inspection in which the measures of length in the sample are classed as defective or not defective in accordance with the provisions of these regulations.

11.1.4. Limiting quality level (LQ 5)

The limiting quality is the quality level of the lot submitted that corresponds in a sampling plan to a 5% probability of acceptance.

11.1.5. acceptable quality level (SQL)

The standard quality level is the quality level of the lot submitted that corresponds in a sampling plan to a 95% probability of acceptance.

11.1.6. Acceptance number

In a statistical check by attributes, the acceptance number is the greatest number of defective measures found in the sample inspected which, if attained, still entails acceptance of the lot under examination.

11.1.7. Rejection number

In a statistical check by attributes, the rejection number is the number of defective measures found in the sample inspected which, if exceeded, entails rejection of the lot under examination.

11.1.8 Simple Sampling Plan

The number of individual measures inspected must be equal to the size of the sample as specified by the plan. If the number of defective measures found in the sample is les than or equal to the acceptance number, the lot must be accepted. If the number of defective measures is greater than or equal to the rejection number the lot must be rejected.

11.1.9 Double sampling plan

The number of individual measures inspected must be equal to the size of the first sample as specified by the plan. If the number of defective measures found in the first sample is less than or equal to the first acceptance number, the lot must be accepted. If the number of defective measures found in the first sample is equal to or greater than the first rejection number, the lot must be rejected. If the number of defective measures found in the first sample falls between the first acceptance number and the first rejection number a second sample must be inspected whose size is specified by the plan. The number of defective measures found in the first and second samples must then be added together. If the total number of defective measures is less than or equal to the second acceptance number, the lot must be accepted. If the total number of defective measures is greater than or equal to the second rejection number, the lot must be rejected.

11.2 Inspection procedures

One of the two inspection methods described below must be used, the choice being left to the body responsible.

The first method, hereinafter called method "A", involves single submission schemes, whilst the second, method "B", involves a multiple submission scheme. The check consists in counting the number of defective measures in the sample taken.

11.2.1. If method "A" is chosen, the body responsible applies, for acceptance or rejection of the lot submitted, a sampling plan with the following characteristics;

- a standard quality level (SQL) between 0.40 and 0.90%
- a limiting quality (LQ 5) between 4,0 and 6,5%.

Examples of sampling plans:

	Sample Size	Acceptance Number	Rejection Number	SQL	LQ5
a	80	1	2	0.44	5.8
b	125	2	3	0.65	5.0

Double Sampling plan

		Sampling Size	Total Size	Acceptance Number	Rejection Number	LQ 5	SQL
a	First Sample	50	50	0	2	5,8	0,44
	Second Sample	50	100	1	2		
b	First Sample	80	80	0	3	5,0	0,65
	Second Sample	80	160	3	4		

If a lot is rejected, the body responsible carries out a 100% inspection of that lot or takes the necessary precautions to prevent the rejected lot from being marketed in that condition.

11.2.2. If the method "b" is used, the body responsible applies, for acceptance or rejection of the lot submitted, sampling plans in accordance with the following table:

Sample plans

Order of Submission	Size	Acceptance number	Rejection Number
1	70	0	1
2	85	0	1
3	105	0	1
4	120	0	1

After a lot has been accepted, the lot submitted next shall be subjected to the inspection appearing under No. 1 in the order of submission.

After a lot has been rejected, the body responsible takes the necessary precautions to prevent the rejected lot from being marketed in the condition and the person responsible for submitting the measures for initial verification may submit either the same lot or another one. The lot is then subjected to the inspection appearing immediately above in the order of submission. However, if the lot is not accepted after an inspection under No. 4 in the order of submission, the body responsible must carry out a 100% inspection of the lot.

11.3 Consequences of frequent rejection of lots.

In the event of frequent rejection of lots, the body responsible may suspend the statistical check. If no improvement of the quality level is found once the shortcoming has been brought to the attention of the holder of the pattern approval, the procedure for

revoking pattern approval in accordance with Article 7 of the Measuring Instruments Regulations ,2002, may be started.

12. Example of the initial verification mark described in point 8.3

