

## COUNCIL DIRECTIVE

of 19 November 1973

on the approximation of the laws of the Member States relating to material measures  
of length

(73/362/EEC)

THE COUNCIL OF THE EUROPEAN COMMUNITIES,

Having regard to the Treaty establishing the European Economic Community, and in particular Article 100 thereof;

Having regard to the proposal from the Commission;

Having regard to the Opinion of the European Parliament;

Having regard to the Opinion of the Economic and Social Committee;

Whereas in the Member States the construction and methods of control of material measures of length are subject to mandatory provisions which differ from one Member State to another and consequently hinder trade in such measures; whereas it is therefore necessary to approximate these provisions;

Whereas the Council Directive of 26 July 1971<sup>(1)</sup> on the approximation of the laws of the Member States relating to provisions both for measuring instruments and methods of metrological control has laid down the EEC pattern approval and EEC initial verification procedures for measuring instruments; whereas in accordance with that Directive, the technical requirements should be laid down which must be fulfilled by material measures of length in order that they may be imported, marketed and freely used after they have been subject to controls and the marks and symbols laid down have been affixed to them,

HAS ADOPTED THIS DIRECTIVE:

*Article 1*

This Directive applies to the material measures of length specified in the Annex.

*Article 2*

Those instruments for measuring length which may bear EEC marks and symbols are described in the

Annex. They shall be subject to EEC pattern approval and shall be submitted to EEC initial verification.

*Article 3*

No Member State may refuse, prohibit or restrict 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.

*Article 4*

1. Member States shall put into force the laws, regulations and administrative provisions needed in order to comply with this Directive within eighteen months of its notification, and shall forthwith inform the Commission thereof.

2. Member States shall ensure that the texts of the main provisions of national law which they adopt in the field covered by this Directive are communicated to the Commission.

*Article 5*

This Directive is addressed to the Member States.

Done at Brussels, 19 November 1973.

*For the Council*

*The President*

IB FREDERIKSEN

<sup>(1)</sup> OJ No L 202, 6. 9. 1971, p. 1.

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**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 verniers, 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 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. The graduation and numbering shall be clear, regular, indelible and carried out in such a way that they enable a sure, simple and unambiguous reading to be made.
- 4.2. The value of the scale interval shall be in the form  $1 \times 10^n$ ,  $2 \times 10^n$  or  $5 \times 10^n$  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 m,
- 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  $2 \times 10^n$  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 m, or a complete multiple of 5 metres.
- 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 authorized by the Council Directive of 18 October 1971 <sup>(1)</sup> on the approximation of the laws of the Member States 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 onwards.
- 6.4. At the sole responsibility of the manufacturer, the coefficient of linear thermal expansion of the material of which the measure is made, in the form:  $\alpha = \dots$ , may be indicated.

<sup>(1)</sup> OJ No L 243, 29. 10. 1971, p. 29.

- 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

- 7.1. The measures of length defined in this Directive shall be divided into three classes, designated I, II and III, according to their degree of accuracy.

In EEC initial verification of measures of length, the maximum permissible error, plus or minus on the nominal length or on the distance between any two scale marks of a measure of length, 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:

Class of accuracy	a	b
I	0.1	0.1
II	0.3	0.2
III	0.6	0.4

- 7.2. However, the maximum permissible errors, plus or minus, on the length of the intervals between the axes of two consecutive scale-marks and the maximum permissible difference between the lengths 'i' of two consecutive intervals shall be fixed for each class of accuracy according to the following table:

length 'i' of the interval in question	maximum permissible error or difference in millimetres, for class of accuracy:		
	I	II	III
$i \leq 1 \text{ mm}$	0.1	0.2	0.3
$1 \text{ mm} < i \leq 1 \text{ cm}$	0.2	0.4	0.6
$1 \text{ cm} < i \leq 1 \text{ dm}$	0.3	0.5	0.9

- 7.3. In addition, for an end measure of length, or a composite measure, 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.

7.4. The maximum permissible error for measures in service shall be equal to twice the maximum permissible error in the initial verification fixed in paragraph 7.1.

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 constructed in such a way that it is able to receive the verification marks laid down by the Council Directive of 26 July 1971, on the approximation of the laws of the Member States relating to common provisions, for both measuring instruments and methods of metrological control. A place must be provided for this purpose near the beginning of the measure.

#### 9. Different kinds of measures of length referred to by the Directive

9.1. Fibre glass and plastic end, line or composite measures, tape measures.

Nominal length between 0.5 and 50 metres.

The tractive force, of about 20 N, shall be indicated.

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

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

9.2. Measures made in one piece, rigid or semi-rigid in metal or other material (for measurements not requiring particular care).

Nominal length between 0.5 and 5 metres.

These measures shall belong to accuracy class 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. Small end, line or composite measures on a winder.

Nominal length of between 0.5 and 5 metres.

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 the classes of accuracy I or II.

9.4.2. Large 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. Large line or composite measures on a winder not designed for the measuring of lengths greater than the nominal length.

Nominal length between 5 and 100 metres.

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

The free end shall include a handle or ring 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 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 appropriate shape, sufficiently heavy to extend the tape correctly and shall be made of a material not liable to cause sparks 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.

9.5. Measures of length made of metal in one piece for careful measurement:

- rigid or semi-rigid (nominal length between 0.5 and 5 m) used particularly as dipsticks,
- flexible (nominal length between 1 and 200 m).

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

The end of rigid measuring-rods shall be provided with a heel or tip which is resistant to impact and wear.

The free end of flexible measures may be provided with a ring, handle or hook not included in the nominal length.

The tractive force, of around 50 N, shall be shown on flexible measures.

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