

## ANNEX MI-009

## DIMENSIONAL MEASURING INSTRUMENTS

The relevant essential requirements of Annex I, the specific requirements of this Annex and the conformity assessment procedures listed in this Annex, apply to dimensional measuring instruments of the types defined below.

## DEFINITIONS

Length measuring instrument	A length measuring instrument serves for the determination of the length of rope-type materials (e.g. textiles, bands, cables) during feed motion of the product to be measured.
Area Measuring Instruments	An area measuring instrument serves for the determination of the area of irregular shaped objects, e.g. for leather.
Multi-dimensional Measuring Instruments	A multi-dimensional measuring instrument serves for the determination of the edge length (length, height, width) of the smallest enclosing rectangular parallelepiped of a product.

## CHAPTER I —

**Requirements common to all dimensional measuring instruments**

## Electromagnetic immunity

- The effect of an electromagnetic disturbance on a dimensional measuring instrument shall be such that:
  - the change in measurement result is no greater than the critical change value as defined in paragraph 2.3; or
  - it is impossible to perform any measurement; or
  - there are momentary variations in the measurement result that cannot be interpreted, memorised or transmitted as a measuring result; or
  - there are variations in the measurement result severe enough to be noticed by all those interested in the measurement result.
- The critical change value is equal to one scale interval.

## CONFORMITY ASSESSMENT

The conformity assessment procedures referred to in Article 9 that the manufacturer can choose between are:

For mechanical or electromechanical instruments:

F1 or E1 or D1 or B + F or B + E or B + D or H or H1 or G.

For electronic instruments or instruments containing software:

B + F or B + D or H1 or G.

## CHAPTER II —

**Length measuring instruments**

## Characteristics of the product to be measured

- Textiles are characterised by the characteristic factor K. This factor takes the stretchability and force per unit area of the product measured into account and is defined by the following formula:

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$K = \varepsilon \cdot (G_A + 2,2 \text{ N/m}^2)$ , where  
 $\varepsilon$  is the relative elongation of a cloth specimen 1 m wide at a tensile force of 10 N,  
 $G_A$  is the weight force per unit area of a cloth specimen in  $\text{N/m}^2$ .

Operating conditions

### 2.1. Range

Dimensions and K-factor, where applicable, within the range specified by the manufacturer for the instrument. The ranges of K-factor are given in Table 1:

TABLE 1

Group	Range of K	Product
I	$0 < K < 2 \times 10^{-2} \text{ N/m}^2$	low stretchability
II	$2 \times 10^{-2} \text{ N/m}^2 < K < 8 \times 10^{-2} \text{ N/m}^2$	medium stretchability
III	$8 \times 10^{-2} \text{ N/m}^2 < K < 24 \times 10^{-2} \text{ N/m}^2$	high stretchability
IV	$24 \times 10^{-2} \text{ N/m}^2 < K$	very high stretchability

2.2. Where the measured object is not transported by the measuring instrument, its speed must be within the range specified by the manufacturer for the instrument.

2.3. If the measurement result depends on the thickness, the surface condition and the kind of delivery (e.g. from a big roll or from a pile), corresponding limitations are specified by the manufacturer.

MPEs

### 3. Instrument

Table 2

Accuracy class	MPE
I	0,125 %, but not less than 0,005 $L_m$
II	0,25 %, but not less than 0,01 $L_m$
III	0,5 %, but not less than 0,02 $L_m$

Where  $L_m$  is the minimum measurable length, that is to say the smallest length specified by the manufacturer for which the instrument is intended to be used.

The true length value of the different types of materials should be measured using suitable instruments (e.g. tapes of length). Thereby, the material which is going to be measured should be laid out on a suitable underlay (e.g. a suitable table) straight and unstretched.

Other requirements

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4. The instruments must ensure that the product is measured unstretched according to the intended stretchability for which the instrument is designed.

## CHAPTER III —

### Area measuring instruments

#### Operating conditions

##### 1.1. Range

Dimensions within the range specified by the manufacturer for the instrument.

##### 1.2. Condition of the product

The manufacturer shall specify the limitations of the instruments due to the speed, and thickness of the surface conditions if relevant, of the product.

MPEs

##### 2. Instrument

The MPE is 1,0 %, but not less than 1 dm<sup>2</sup>.

Other requirements

##### 3. Presentation of the product

In the case of pulling back or stopping the product, it should not be possible to have an error of measurement or the display must be blanked.

##### 4. Scale interval

The instruments must have a scale interval of 1,0 dm<sup>2</sup>. In addition, it must be possible to have a scale interval of 0,1 dm<sup>2</sup> for testing purposes.

## CHAPTER IV —

### Multidimensional measuring instruments

#### Operating conditions

##### 1.1. Range

Dimensions within the range specified by the manufacturer for the instrument.

##### 1.2. Minimum dimension

The lower limit of the minimum dimension for all values of the scale interval is given in Table 1.

TABLE 1

Scale interval (d)	Minimum dimension (min)(lower limit)
$d \leq 2$ cm	10 d
$2$ cm $< d \leq 10$ cm	20 d
$10$ cm $< d$	50 d

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### 1.3. Speed of the product

The speed must be within the range specified by the manufacturer for the instrument.

MPE

### 2. Instrument:

The MPE is  $\pm 1,0$  d.