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Section 5.50. Fabric-Measuring Devices

A. Application

A.1. General. – This code applies only to mechanisms and machines designed to indicate automatically (with or without value-computing capabilities) the length of fabric passed through the measuring elements.

A.2. Devices Used to Measure Other Similar Material in Sheet, Roll, or Bolt Form. – Insofar as they are clearly appropriate, the requirements and provisions of this code apply also to devices designed for the commercial measurement of other material similar to fabrics, in sheet, roll, or bolt form.

A.3. Additional Code Requirements. – In addition to the requirements of this code, Fabric-Measuring Devices shall meet the requirements of Section 1.10. General Code.

S. Specifications

S.1. Units. – A fabric-measuring device shall indicate lengths as follows:

(a) For devices indicating in metric units, lengths shall be indicated in terms of 5 cm; 10 cm; 25 cm; or 50 cm and meters.

In addition, lengths may be indicated in terms of any or all of the following subdivisions: millimeters and centimeters.

(b) For devices indicating in U.S. customary units, lengths shall be indicated in terms of 1/8 yd; ¼ yd; or ½ yd; and yards.

In addition, lengths may be indicated in terms of any or all of the following subdivisions: 1/8 yd; 1/16 yd; inches and feet.

Digital indicators may indicate values in decimal fractions.
(Amended 1977)

S.2. Design of Indicating Elements.

S.2.1. Graduations.

S.2.1.1. Length. – Graduations shall be so varied in length that they may be conveniently read.

S.2.1.2. Width. – In any series of graduations, the width of a graduation shall in no case be greater than the width of the minimum clear interval between graduations, and the width of main graduations shall be not more than 50 % greater than the width of subordinate graduations. Graduations shall in no case be less than 0.2 mm (0.008 in) in width.

S.2.1.3. Clear Interval between Graduations. – The clear interval between graduations shall be at least 6 mm for cm graduations (¼ in for 1/8 yd graduations), and 3 mm for 20 cm graduations (1/8 in for 1 in graduations).

S.2.2. Indicator.

S.2.2.1. Symmetry. – The index of an indicator shall be symmetrical with respect to the graduations, at least throughout that portion of its length associated with the graduations.

S.2.2.2. Length. – The index of an indicator shall reach to the finest graduations with which it is used, unless the indicator and the graduations are in the same plane, in which case the distance between the end of the indicator and the ends of the graduations, measured along the line of the graduations, shall be not more than 1.0 mm (0.04 in).

S.2.2.3. Width. – The index of an indicator shall not be wider than the narrowest graduations with which it is used, and shall in no case exceed 0.4 mm (0.015 in).

S.2.2.4. Clearance. – The clearance between the index of an indicator and the graduations shall in no case be more than 1.5 mm (0.06 in).

S.2.2.5. Parallax. – Parallax effects shall be reduced to the practicable minimum.

S.2.3. Money-Value Computations.

S.2.3.1. Full-Computing Type. – In this type, the money value at each of a series of unit prices shall be computed automatically for every length within the range of measurement of the fabric-measuring device. Value graduations shall be provided and shall be accurately positioned. The value of each graduated interval shall be 1 cent at all prices per yard of 30 cents and less, and shall not exceed 2 cents at higher prices per yard. Five-cent intervals may be represented in the two-cent range by special graduations, but these shall not be positioned in the clear intervals between graduations of the regular series.

S.2.3.2. Limited-Computing Type. – In this type, the money value at each of a series of unit prices shall be computed automatically only for lengths corresponding to a definite series of length graduations. There shall be no value graduations. At no position that the chart can assume shall two value figures at the same price per yard be completely and clearly exposed to view at one time. Money values shown shall be mathematically accurate, except that a fraction of less than ½ cent shall be dropped and the next higher cent shall be shown in the case of a fraction of ½ cent or more. One of the following requirements shall be met:

(a) There shall be a money-value computation for each length graduation within the range of measurement of the device.

(b) No money-value computation shall be exposed to view except at such times as the device shows a length indication for which a corresponding series of value indications is computed.

(c) Each column or row of money-value computations shall be marked to show the length to which the computations correspond, the device shall be marked to show the character and limitations of the computations, and there shall be computations corresponding to at least 10 cm ($^1/_8$ yd) throughout the range of measurement of the device.

S.2.4. Return to Zero. – Primary indicating elements shall be readily returnable to a definite zero indication. Means shall be provided to prevent the return of the indicating elements beyond their correct zero positions.

S.3. Marking Requirements. – If a device will not accurately measure all fabrics, it shall be marked to indicate clearly its limitations.

S.4. Design Accuracy. – Indications of length and money value shall be accurate whether the values of the indications are being increased or decreased.

N. Notes

N.1. Testing Medium. – A fabric-measuring device shall be tested with a suitable testing tape approximately 7.62 cm (3 in) wide and with a graduated length of at least 11 m (12 yd), made from such material and having such surface finish as to provide dimensional stability and reduce slippage to the practicable minimum.

T. Tolerances

T.1. Tolerance Values. – Maintenance and acceptance tolerances shall be as shown in Table 1. Maintenance and Acceptance Tolerances for Fabric-Measuring Devices.

Table 1.
Maintenance and Acceptance Tolerances for Fabric-Measuring Devices

Indication of Device (yards)	Maintenance Tolerance		Acceptance Tolerance	
	On Under-registration (inches)	On Over-registration (inches)	On Under-registration (inches)	On Over-registration (inches)
2 or less	3/8	¼	¼	1/8
3	3/8	5/16	¼	5/32
4	½	5/16	¼	5/32
5	5/8	3/8	5/16	3/16
6	¾	3/8	3/8	3/16
7 and 8	1	½	½	¼
9	1¼	5/8	5/8	5/16
10 and 11	1½	¾	¾	3/8
12 and 13	1¾	7/8	7/8	7/16
14 and 15	2	1	1	½
Over 15	Add 1/8 inch per indicated yard	Add 1/16 inch per indicated yard	Add 1/16 inch per indicated yard	Add 1/32 inch per indicated yard

UR. User Requirements

UR.1. Installation Requirements.

UR.1.1. Installation. – A fabric-measuring device shall be securely supported and firmly fixed in position.

UR.2. Use Requirements.

UR.2.1. Limitation of Use. – A fabric-measuring device shall be used to measure only those fabrics that it was designed to measure, and in no case shall it be used to measure a fabric that a marking on the device indicates should not be measured.

UR.2.2. Return of Indicating Elements to Zero. – The primary indicating elements shall be returned to zero before each measurement.

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