SRI LANKA STANDARD SLS 89 : 2006
UDC: 677.064 : 531.717.8

METHOD FOR
DETERMINATION OF BOW, SKEW AND LENGTHWAY DISTORTION IN WOVEN AND KNITTED FABRICS
(FIRST REVISION)

SRI LANKA STANDARDS INSTITUTION

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SLS 89 : 2006

Gr. 5

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SRI LANK

Sri Lanka Standards are subject to periodical revision in order to accommodate the progress made by industry. Suggestions for improvement will be recorded and brought to the notice of the Committees to which the revisions are entrusted.

This standard does not purport to include all the necessary provisions of a contract.

SRI LANKA STANDARD
METHOD FOR DETERMINATION OF BOW, SKEW AND LENGTHWAY DISTORTION IN WOVEN AND KNITTED FABRICS
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FOREWORD

This Standard was approved by the Sectoral Committee on Textiles, Clothing and Leather and was authorized for adoption and publication as a Sri Lanka Standard by the Council of Sri Lanka Standards Institution on 2006-07-26.

CS 89 was first published in 1970 as method for the determination of bow and skewness in woven fabrics. In this revision the title of the standard is altered to introduce lengthway distortion and is applicable to both woven and knitted fabrics.

Bow & skew can be present in fabrics as defects. These are however idealized defects and the combination of both weft or width way bow and skew results in the total lengthway distortion which is the property of interest particularly to the garment maker. Width way bow and skew are likely to occur sporadically in certain pieces of fabrics and the normal provision for random sampling may not be appropriate. Lengthway distortion is generally best ascertained on the fabric roll at the time of inspection and the worst areas can be most readily observed at this time. Therefore, tests are not always carried out in the standard atmosphere for testing textile and such tests are quite acceptable in many instances. However in cases of dispute and when results of high accuracy are required, test shall be made in the standard atmosphere for testing textile on samples removed from the bulk.

In reporting results of a test or an analysis made in accordance with this standard, if the final value obtained or calculated is to be rounded off, it shall be done in accordance with **CS 102**.

In this revision the assistance derived from the following publications is gratefully acknowledged.

BS 2819 : 1990 British standard methods for determination of bow, skew and lengthway distortion in woven and knitted fabrics.

BSEN 1773 : 1997 Textile fabrics – Determination of width and length.

ASTM D 3882 : Standard test method for bow and skew in woven and knitted fabrics

1 SCOPE

This standard describes methods for determining the bow, skew and lengthway distortion in woven and knitted fabrics.

2 REFERENCE

SLS 16 : Standard atmospheres for conditioning and testing of textiles.
CS 102 : Presentation of numerical values

3 DEFINITIONS

For the purpose of this standard, the following definitions shall apply :

3.1 weft bow : A fabric condition that results when weft yarns in a woven fabric or courses in a knitted fabric form one or more arcs across the fabric width.

3.2.1 warp bow : A fabric condition that results when warp yarns in a woven fabric or wales in a knitted fabric form an arc along (within) a specific length of a fabric that could be visually observed.

NOTE : *Bow may assume many different forms and some are shown in Figure **1**.*

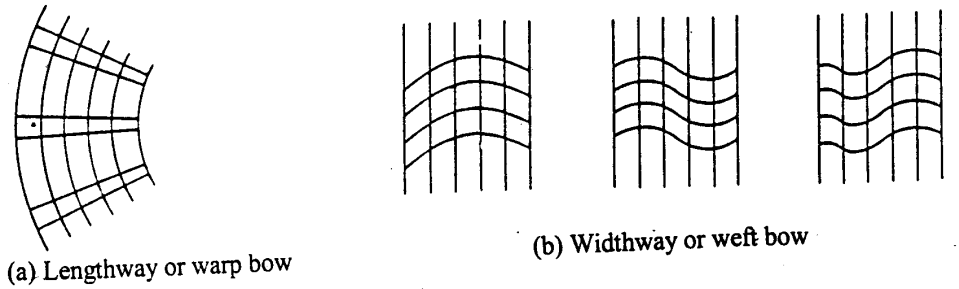

Figure 1 - Types of bow

3.3 skew : A fabric condition where the weft yarns or knit courses, although straight, are not at right angles to the ends or wales.

NOTE : *Some skew conditions are shown in Figure **2**.*

Figure 2 – Illustration of skew

3.4 lengthway distortion : A combination of weft bow and skew which may assume many different forms.

NOTE : *Examples of the forms assumed as a result of lengthway distortion are shown in Figure 3.*

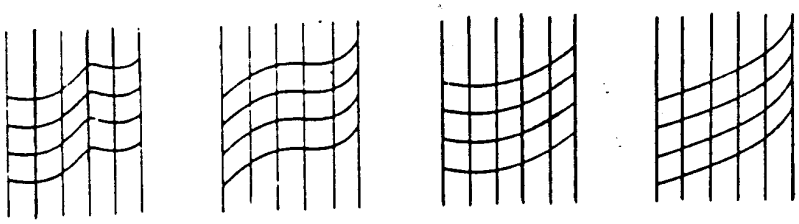

Figure 3 – Illustrations of lengthways distortion

4 PRINCIPLE

4.1 Weft bow is measured as the maximum perpendicular distance which a pick or course deviates from a straight line joining the extremities of the pick or course.

4.2 Warp bow is measured as the greatest perpendicular distance between the edge of the fabric and a straight line joining two selected points of the edge.

4.3 Skew is measured as the distance between one end of a pick or course and the point on the same edge intersected by a line from the other end of the pick or course running at right angles to the fabric length.

4.4 Lengthway distortion is measured as the greatest lengthway distance covered by a pick or course.

5 APPARATUS

5.1 Calibrated ruler, graduated in millimetres, not less than 1 m in length or not less than the width of the fabric, whichever is higher.

5.2 Set square, with two sides at right angles with the sides forming the right angle graduated in millimetres.

6 ATMOSPHERE FOR CONDITIONING AND TESTING

The conditioning and testing atmospheres shall be the standard atmosphere for testing textiles as defined in **SLS 16.**

7 TEST SPECIMEN

7.1 When test specimens are removed form the bulk, it shall be ensured that the minimum possible stress is applied to the fabric.

7.2 Specimens shall be of full width of the fabric and the minimum length shall be 500 mm for weft bow and 1 m for warp bow.

7.3 When the average skew or average lengthway distortion is to be determined, at least five test specimens shall be taken.

NOTE : *Do not take test specimens within 1 m of the ends of the fabric roll.*

8 PROCEDURE

8.1 General

8.1.1 Make measurements on a flat surface without tension.

8.1.2 Specimens shall be conditioned, by allowing them to stand in the standard atmosphere for textile testing (**SLS 16**) for at least 24 hours prior to testing and measure in the same atmosphere.

8.2 Weft or course bow

8.2.1 Trace one pick/course across the full width using a marker without distorting the fabric.

NOTE : *It may be necessary to do this on the back of the fabric.*

8.2.2 Place the ruler across the fabric width connecting the points at which the marked pick/course meets the edge of the fabric.

8.2.3 Slide the set-square gently along the ruler and record the greatest perpendicular distance between the pick/course and the ruler to the nearest millimetre as shown in figure **4 (a).**

8.2.4 In the case of bow shown in Figure **4 (b)**, place the ruler parallel to the straight line joining the points at which the marked pick/course meets the edges of the fabric and measure the greatest perpendicular displacement between the extreme point of the curve and the ruler to the nearest millimetre.

8.2.5 Measure the overall fabric width "W" in millimeters as the distance between the outermost edges measured perpendicular to the edges.

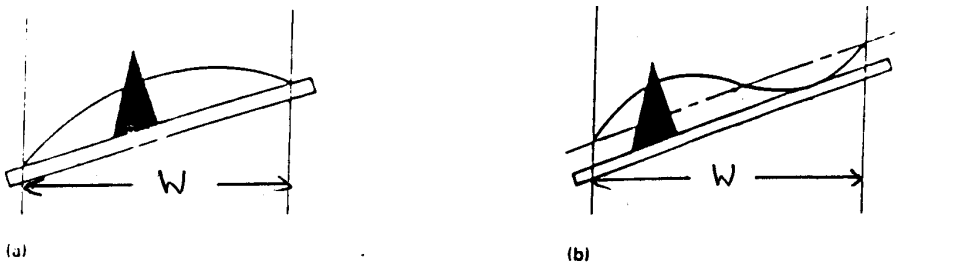

Figure 4– Measurement of weft bow

8.3 Warp or wale bow

8.3.1 Place the ruler to form a chord 500 mm long to the curved surface as shown in figure **5**.

8.3.2 Gently slide the set square along the ruler and record the greatest perpendicular distance between the edge of the fabric and the ruler to the nearest millimetre.

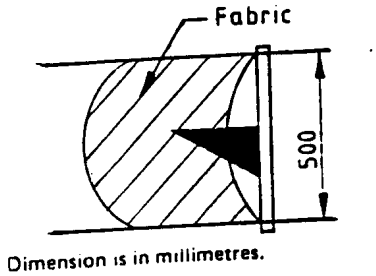

Figure 5 – Measurement of warp bow

8.4 Skew

8.4.1 Trace on pick/course as described in **8.2.1.**

8.4.2 Placing the ruler across the fabric at right angles to the warp ends/wales and coinciding with one end of the marked pick/course, slide the set square gently to the opposite edge and measure the distance, d, between the other end of the marked pick/course and the ruler to the nearest millimetre as shown in Figure **6 .**

8.4.3 Measure the overall fabric width " W " in millimetres as described in **8.2.5**.

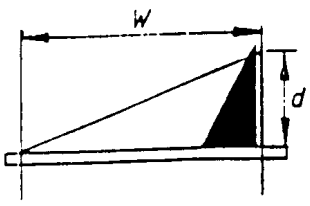

Figure 5 – Measurement of skew

8.5 Lengthway distortion

8.5.1 Trace one pick/course as described in **8.2.1.**

8.5.2 Place the ruler across the fabric at the nearest extreme of the marked thread so that the ruler is at right angles to the warp ends/wales, as shown in Figure **7**.

8.5.3 Slide the set square gently along the ruler and measure the greatest perpendicular distance,
d, between the ruler and the far extremity of the marked thread, in millimetres, as shown in Figures **7**.

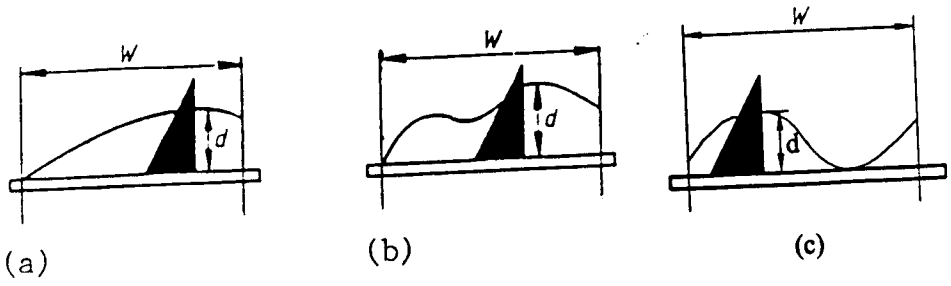

Figure 7 – Measurement of lengthway distortion

8.5.4 Measure the overall fabric width 'W' , in millimetres as described in **8.2.5**.

9 EXPRESSION OF RESULTS

9.1 Express individual measurements of warp bow in millimetres without further calculation.

9.2 Express the individual measurements of weft bow in millimetres without further calculation.

9.3 Calculate the percentage skew and length way distortion from the formula.

$$\%\ Skew\ \ or\ \%\ distortion\ \ =\ \ \frac{d}{W}\ \ x\ \ 100$$

where,

d is the skew/distortion measured (in millimetres)
W is the overall fabric width (in millimetres)

10 TEST REPORT

10.1 The report shall include ;

a) The number and the year of the Sri Lanka Standard;
b) Whether or not the specimens were removed from the bulk;
c) A description of the sample tested.

10.2 The following shall be reported as appropriate :

(a) The individual measurements of warp bow (in mm);
(b) The individual measurements of weft bow (in mm) together with the fabric width;
(c) The individual percentage skew measurements . The average percentage skew and its direction (figure 2) shall be reported, if it is present as an attribute;
(d) The individual percentage lengthway distortion and if required, the average value.

SRI LANKA STANDARDS INSTITUTION

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