

INTERNATIONAL STANDARD 3933

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

Textiles — Woven fabrics — Measurement of length of pieces

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FOREWORD

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Draft International Standards adopted by the Technical Committees are circulated to the Member Bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 3933 was drawn up by Technical Committee ISO/TC 38, *Textiles*, and was circulated to the Member Bodies in September 1975.

It has been approved by the Member Bodies of the following countries :

Belgium	Israel	Spain
Czechoslovakia	Italy	Sweden
Egypt, Arab Rep. of	Japan	Switzerland
Finland	Netherlands	Turkey
France	New Zealand	United Kingdom
Germany	Norway	U.S.A.
Hungary	Poland	U.S.S.R.
India	Romania	Yugoslavia
Iran	South Africa, Rep. of	

No Member Body expressed disapproval of the document.

Textiles — Woven fabrics — Measurement of length of pieces

0 INTRODUCTION

The length of a piece of fabric is influenced by the strains imposed during manufacture, finishing and storage, and by the moisture content of the fabric at the time of measurement. In order to determine its length accurately it is, therefore, essential to allow the fabric to become relaxed and to condition it (preferably in the standard atmosphere for testing) before the measurements are made.

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies two methods for the determination of the length of pieces (of any length) of woven fabrics that are in the state of relaxation obtained by exposure (free from applied tension) to the standard atmosphere for testing.

The methods are applicable to woven fabrics (including "stretch" fabrics) made up full width or folded down the middle.

2 REFERENCE

ISO 139, *Textiles — Standard atmospheres for conditioning and testing*.

3 DEFINITION

length of piece: The distance between the outermost complete weft threads in a piece, other than weft threads of other materials at the end(s) of the piece.

4 PRINCIPLE

4.1 Method 1

When the complete piece can be conditioned in the standard atmosphere for testing, a series of measured intervals (of length determined by a graduated steel rule) is marked along the conditioned piece, and the total length is derived from the lengths of the intervals.

4.2 Method 2

When it is impracticable to condition the whole piece in the standard atmosphere for testing, the length of the piece

is determined (as in method 1) after relaxation in the prevailing atmosphere, and this length is then corrected by the application of a factor based on measurement of the length of a specific portion of the relaxed piece that has been conditioned (with or without removal from the piece) in the standard atmosphere.

NOTE — Method 2 is only suitable when high precision is not necessary.

5 APPARATUS

5.1 Calibrated steel rule, of length at least 2 m and preferably 3 m, and graduated in centimetres and millimetres.

5.2 Table, having a smooth flat surface, of width greater than that of the fabric when prepared for measuring, and of length at least 4 m. If a table of substantially greater length is used, the distance between temporary marks (see 7.3.1 and 7.3.3) can also be increased.

6 STANDARD ATMOSPHERE

The standard temperate atmosphere for testing has a relative humidity (RH) of $65 \pm 2\%$ at a temperature of $20 \pm 2^\circ\text{C}$. In tropical regions a temperature of $27 \pm 2^\circ\text{C}$ may be used, subject to the agreement of the interested parties. (See ISO 139.)

7 PROCEDURE

7.1 Location of marks and measurements

7.1.1 Fabric made up full width

Measure and mark the fabric along two lines, each positioned at a distance of about one-quarter of the width of the fabric from the adjacent selvedge.

7.1.2 Fabric folded down the middle

Measure and mark one side of the fabric along a line approximately half-way between the selvedge and the fold, then turn the fabric over and mark and measure the other side in a similar manner.

NOTE — Pieces of width less than that of the measuring table may be opened and measured as described in 7.1.1.

7.2 Accuracy of measurements

Take each measurement to the nearest millimetre.

7.3 Method 1

7.3.1 Preliminary markings

Place the piece on the table (at full width, folded down the middle if received in this state) so that the first 3 to 4 m portion lies flat and free from applied tension, and make temporary marks¹⁾ 3 m or 2 m apart, near the end of the piece. Then draw the fabric gently along the table until the middle portion of the piece lies flat and free from applied tension, and make a second pair of temporary marks. Finally, draw the remainder of the fabric gently along the table until the last 3 to 4 m portion lies flat and free from applied tension, and make a third pair of temporary marks.

7.3.2 Conditioning

With the fabric so arranged that it is free from applied tension and its surfaces are freely exposed to the standard atmosphere²⁾, condition it until the mean difference between successive measurements, made at intervals of at least 24 h, of the distance between the marks in each pair of temporary marks is less than 0,25 % of the final average length.

7.3.3 Final measurements

Remove the temporary marks, place the fabric on the table and, manipulating it as described in 7.3.1, make marks at 3 m or 2 m intervals, as relevant, along the lines prescribed in 7.1, and measure the length of the portion between the last mark and the end of the piece.

7.4 Method 2

7.4.1 Relaxation and relaxed length

Allow the piece to relax, free from applied tension, in the prevailing atmosphere for at least 24 h. Then place the piece on the table (at full width, or folded down the middle if received in this state) and use the procedure given in 7.3.3 to measure its relaxed length.

7.4.2 Marking for determination of correction factor

Manipulate the piece as described in 7.3.1, until the middle 3 to 4 m portion lies flat and free from applied tension on the table, and on this portion make four pairs of datum marks, the distance between the marks in each pair being at least 1 m but preferably 2 m or 3 m, and the pairs being equally spaced across the width of the fabric but no pair being nearer to a selvedge than one-tenth of the width of the fabric. Measure and record the distance between the marks in each pair.

1) These temporary marks are made only to determine completion of relaxation and conditioning.

2) Convenient methods of arranging the fabric on the table are described in the annex.

7.4.3 Conditioning and final measurements

Freely expose the portion marked in accordance with 7.4.2 (with or without removal from the piece) to the standard atmosphere until the mean difference between successive measurements, made at intervals of at least 24 h, of the distance between the marks in each pair of datum marks is less than 0,25 %.

8 EXPRESSION OF RESULTS

8.1 Method 1

Determine each of the two lengths measured in accordance with 7.3.3 by counting the number of 3 m or 2 m units, as relevant, marked on the piece and adding the length of the remaining portion. Take the mean of the two results (to the nearest centimetre) as the length of the piece.

8.2 Method 2

Calculate the length of the piece (to the nearest centimetre) from the following formula :

$$L_c = L_r \times \frac{L_{sc}}{L_s}$$

where

L_c is the length, in centimetres, of the piece after conditioning;

L_r is the length, in centimetres, of the piece after relaxation in the prevailing atmosphere (calculated as in 8.1 from the results of the measurements made in 7.4.1);

L_{sc} is the mean distance, in centimetres, between the datum marks on the conditioned portion (see 7.4.3);

L_s is the mean distance, in centimetres, between the datum marks on the relaxed portion before conditioning (see 7.4.2).

9 TEST REPORT

The test report shall include the following particulars :

- a) a statement that the test was performed in accordance with this International Standard;
- b) date of the test;
- c) length of the piece, to the nearest centimetre;
- d) whether the result was obtained by method 1 or method 2;
- e) details of any deviation from the specified test procedure.

ANNEX

ARRANGEMENT OF PIECES FOR CONDITIONING AND MEASUREMENT

A convenient and effective method of arranging a long piece of fabric for conditioning so that it is free from applied tension and is well exposed to the conditioning atmosphere is to unroll the piece and lay it in loose corrugated folds of suitable size. (See figure 1.)

During marking and measuring it is essential that the piece of fabric whose length is being determined should be free from tension as it lies on the measuring table. To achieve this it has been found convenient to cuttle-fold (see figure 2) the ends of the piece which extend beyond the portion being measured, thus producing a stack of fabric at each end of the portion being measured.

If the measuring table is too short to enable this method to be used, supplementary tables may be used at each end of the measuring surface, provided that such extra tables are of exactly the same height and width as those of the main table, and that they are so placed as to form (with the measuring table) a continuous rectangular surface.

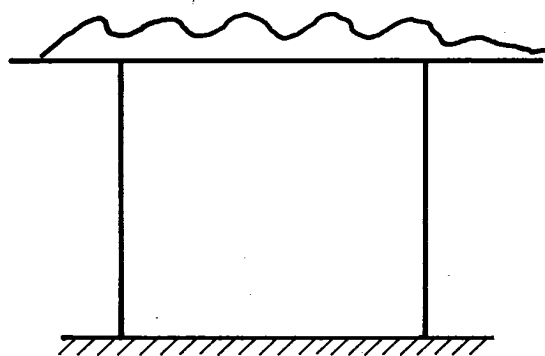


FIGURE 1 — Loose folding

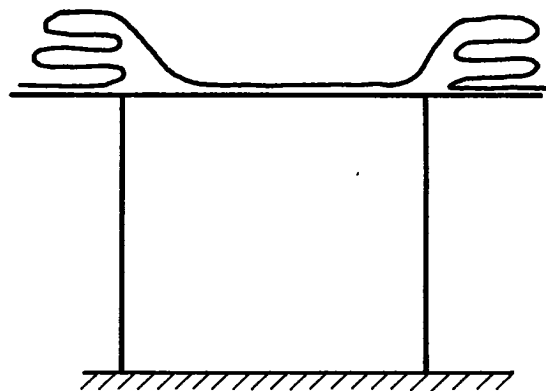


FIGURE 2 — Cuttle-folding