BS 3424 : Part 20 : 1987

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British Standard

Testing coated fabrics

Part 20. Method 23. Method for determination of dimensional changes on mechanical relaxation at zero tension

Essais des supports textiles revêtus
Partie 20. Méthode 23. Méthode de détermination des variations dimensionnelles après relaxation mécanique à tension nulle

Prüfung beschichteter Gewebe
Teil 20. Verfahren 23. Verfahren zur Bestimmung der Maßänderung bei mechanischer Erholung und Nullspannung

IMPORTANT NOTE. It is recommended that this Part be read in conjunction with the information in Part 0 'Foreword and general introduction'.

Foreword

During the processing, production and subsequent batching and rolling operations carried out in the manufacture of a coated fabric, strains are introduced which are, at various times during the manufacturing process, alleviated, re-introduced, increased or maintained for varying periods of time. These strains are unlikely to be constant throughout the entire length of the roll. When, for example, the coated fabric is batched or re-wound after manufacture, the tension introduced into the coated fabric will tend to be greater when the roll is being wound at or near its maximum diameter than when it is at its minimum diameter. This difference in tension or strain may be even greater when the machinery being used is spindle driven, so that the surface speed of the roll being wound increases as its diameter increases. Even with surface driven rolls, i.e. when the surface speed of the roll being wound is constant, the tension introduced may vary depending upon the type of let-off motion employed on the feed supply.

In addition to these variables, as the coated fabric is exposed to elevated temperatures during its processing, the finished product normally contains less than its normal moisture content.

When, therefore, the coated fabric is unrolled and allowed to relax in a normal atmosphere under zero tension, the processing tensions or strains tend to decay and/or equalize and the coated fabric may absorb moisture. This decay of processing tensions and moisture uptake often result in dimensional changes occurring. It is these dimensional changes that this method of test seeks to measure.

This Part supersedes method 23 of BS 3424 : 1973.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

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1 Scope

This Part of BS 3424 describes a method for determining the dimensional changes occurring when a coated fabric is allowed to relax mechanically under zero tension in the standard atmosphere for conditioning and testing.

NOTE. The titles of the publications referred to in this standard are listed on page 3.

2 Principle

The roll of coated fabric under examination is unrolled along a horizontal flat surface and gauge marks are made in either the width or the length directions or both. The coated fabric thus marked is exposed for 24 h under zero tension in the standard atmosphere for conditioning and testing, after which the distances between the pairs of reference marks are measured and the dimensional changes determined.

3 Apparatus

3.1 *Rule.* A steel tape, graduated in mm, complying with BS 4035.

3.2 *Flat surface.* A clean, horizontal flat surface of at least 2.5 m in length and a width at least 100 mm wider than the material under test. It shall be free of rough areas likely to prevent the coated fabric moving freely.

4 Procedure

4.1 Marking

Without noticeably increasing the tension in the material, unroll the coated fabric on the flat surface (**3.2**), with the substrate side uppermost in the case of single-face coated fabrics. Without delay ensure that the material is flat and mark the upper surface, as shown in figure **1**, as required, i.e. in the longitudinal or transverse directions or both or in the centre only, relevant to clause **5**(a), **5**(b), **5**(c), **5**(d) or **5**(e) as required. The distance between pairs of marks in the longitudinal direction shall be 2 m, avoiding the first and last metre, and no marks shall be within 50 mm of a selvedge. Measure and record to the nearest mm the distance between the marks.

4.2 Condition

Expose the material for at least 24 h under zero tension in the standard atmosphere for conditioning and testing specified in method 4 (i.e. BS 3424 : Part 2).

4.3 Measure

Measure and record the distances to the nearest mm between the marks made as described in **4.1** and record the difference, if any.

4.4 Re-roll

Re-roll the coated fabric on to a new cloth centre and carry out the procedure described in **4.1**, **4.2** and **4.3** at the other end of the roll.

5 Calculation and expression of results

Calculate any shrinkage or extension in the material as a percentage of the original dimension, as follows:

(a) % dimensional longitudinal change (left hand)

$$= \frac{(L_2 - L_1) \times 100}{L_1} ;$$

(b) % dimensional longitudinal change (centre)

$$= \frac{(C_2 - C_1) \times 100}{C_1} ;$$

(c) % dimensional longitudinal change (right hand)

$$= \frac{(R_2 - R_1) \times 100}{R_1} ;$$

(d) % dimensional transverse change (running end)

$$= \frac{(T_2 - T_1) \times 100}{T_1} ;$$

(e) % dimensional transverse change (end)

$$= \frac{(E_2 - E_1) \times 100}{E_1} ;$$

where

L_1 is the original dimension in the longitudinal direction between gauge marks A and F, taken at **4.1**;

L_2 is the dimension, being the largest deviation from L_1, of the two measurements taken at **4.3** and **4.4**;

C_1 is the original dimension in the longitudinal direction between gauge marks B and E taken at **4.1**;

C_2 is the dimension, being the largest deviation from C_1, of the two measurements taken at **4.3** and **4.4**;

R_1 is the original dimension in the longitudinal direction between gauge marks C and D taken at **4.1**;

R_2 is the dimension, being the largest deviation from R_1, of the two measurements taken at **4.3** and **4.4**;

T_1 is the original dimension in the transverse direction between gauge marks A and C taken at **4.1**;

T_2 is the dimension, being the largest deviation from T_1, of the two measurements taken at **4.3** and **4.4**;

E_1 is the original dimension in the transverse direction between gauge marks F and D taken at **4.1**;

E_2 is the dimension, being the largest deviation from E_1, of the two measurements taken at **4.3** and **4.4**.

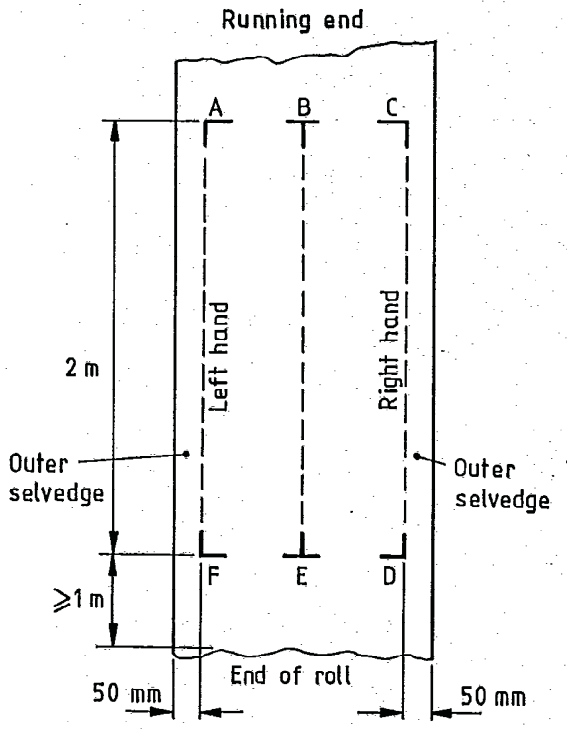

Figure 1. Position of gauge marks on the surface of the coated fabric for determination of dimensional changes on mechanical relaxation at zero tension

6 Test report

The test report shall include the following information:

(a) the description of the coated fabric;

(b) the percentage dimensional change in the longitudinal direction. If there is any difference in the percentage dimensional change across the width of the coated fabric, i.e. at 5(a), 5(b) or 5(c), report all three results;

(c) the percentage dimensional change in the transverse direction. If there is any difference in the percentage dimensional change along the length of the coated fabric, i.e. at 5(d) or 5(e), report both results;

(d) a reference to this method of test, i.e. method 23 of BS 3424 : Part 20;

(e) any deviation from the standard test procedure.

Publications referred to

BS 3424 Testing coated fabrics
Part 2 Method 4 Conditioning and selection of test specimens
BS 4035 Specification for linear measuring instruments for use on building and civil engineering constructional works.
Steel measuring tapes, steel bands and retractable steel pocket rules

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British Standards Institution · 2 Park Street London W1A 2BS · Telephone 01-629 9000 · Telex 266933

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