BRITISH STANDARD

BS 3424 :
Part 36 : 1993

Testing coated fabrics

Part 36. Method 39. Method for determination of the dimensional stability of coated fabrics to domestic washing

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

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Foreword

This Part of BS 3424 has been prepared under the direction of the Plastics and Rubber Standards Policy Committee.

In preparing this Part of BS 3424 it has been acknowledged that many coated fabric products are washed in domestic-type washing machines and also that the main washing criteria affecting dimensional stability could be achieved without necessarily invoking the full requirements of BS 4923.

This method of test, whilst intended primarily for assessing the dimensional stability to washing may also be used in conjunction with ageing tests for the removal of hydrolysed residues where these may be present.

However, colour fastness to washing tests should be conducted in accordance with BS 1006 : section C02.

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

1 Scope

This Part of BS 3424 describes a method for determining the dimensional stability of coated fabrics to washing using a commercial domestic type washing machine.

2 References

2.1 Normative references

This Part of BS 3424 incorporates, by reference, provisions from specific editions of other publications. These normative references are cited at the appropriate points in the text and the publications are listed on the inside back page. Subsequent amendments to, or revisions of, any of these publications apply to this Part of BS 3424 only when incorporated in it by updating or revision.

2.2 Informative references

This Part of BS 3424 refers to other publications that provide information or guidance. Editions of these publications current at the time of issue of this standard are listed on the inside back page, but reference should be made to the latest editions.

3 Definition

For the purposes of this Part of BS 3424 the following definition applies.

delamination

The partial or whole separation of two, or more, of the component layers of a coated fabric. This can be either a fabric to polymer separation or a separation within the actual polymeric layer.

NOTE. See **6.3** of BS 3424 : Part 9 : 1990.

4 Principle

Five test specimens are conditioned and marked with dimension datum lines in accordance with BS 4931 : 1986. They are then subjected to three consecutive domestic washing procedures, using standard criteria, after which they are dried, pre-conditioned and conditioned prior to the dimensions of the datums being determined and the dimensional stability calculated.

5 Apparatus

5.1 *Washing machine and wash programme* conforming to table 1.

5.2 *Detergent* conforming to table 2.

Table 1. Parameters for domestic type washing machine and suitable wash programme for the test

Parameter	Value or number
Internal drum axis	Horizontal (i.e. front loading)
Internal drum capacity volume	44 litres
Lifting vanes	3 × 120° of height 5.0 cm ± 0.5 cm
Drum speed during normal wash	55 r/min ± 3 r/min
Typical drum agitator action during normal wash rotation	min. 11 s clockwise min. 3 s stop min. 11 s anti-clockwise min. 3 s stop
Minimum duration of normal wash cycle	25 mins
Number of rinse cycles	Three
Minimum duration of each rinse cycle	1 min
Total dry load	4.0 kg ± 0.1 kg including makeweights (see **5.3**)
Minimum liquor ratio	4.4 l/kg
Spin speed	1000 r/min ± 20 r/min
Minimum mean temperature of water supply	15 °C
Wash details total number of cycles (including washing and rinsing)	Three continuous washing cycles using detergent without removal from machine
Temperature of wash	max. 40 °C

Table 2. Nominal composition of ECE reference detergent (without optical brightener)[1)]

Component	Percentage *m/m*
Linear sodium alkyl benzene sulphonate (mean length of alkane chain: $C_{11.5}$)	8.0
Ethoxylated tallow alcohol (14 EO)	2.9
Sodium soap	3.5
(Chain length: C_{12} to C_{16} : 13 % to 26 %; C_{18} to C_{22} : 74 % to 87 %)	
Sodium tripolyphosphate	43.7
Sodium silicate (SiO_2/Na_2O = 3.3/1)	7.5
Magnesium silicate	1.9
Carboxymethylcellulose (CMC)	1.2
Ethylene diamine tetra-acetic acid (tetrasodium salt) (EDTS, sodium salt)	0.2
Sodium sulphate	21.2
Water	9.9
Total	100.0

[1)] For information on the availability of the reference detergent, write to Customer Services, Information Services Group, BSI, Linford Wood MK14 6LE.

5.3 Makeweights

Prepare makeweights, consisting of two layers of knitted polyester fabric, each 30 cm ± 3 cm × 30 cm ± 3 cm and of mass 35 g ± 3 g, sewn together at the edges; or pieces of undyed spun polypropylene fabric, 30 cm ± 3 cm × 30 cm ± 3 cm of approximately 160 g/m^2 mass per unit area, hemmed to prevent unravelling along the edges.

NOTE. Polypropylene fabric is not suitable as a dummy load when washing at temperatures above 50 °C.

6 Sampling, selection and preparation of test specimens

Draw a sample approximately 2 m × full width from an identifiable manufacturing batch and select from the sample five test specimens each 400 mm × 400 mm from positions evenly spaced throughout the sample.

NOTE. An example of test specimen distribution within a sample is shown in figure 1.

7 Conditioning and marking

7.1 Conditioning

Condition the five test specimens for at least 4 h at 20 °C ± 2 °C and 65 °C ± 5 % relative humidity.

7.2 Marking

Mark up each of the five test specimens with datum lines in accordance with method B of **5.2** of BS 4931 : 1986.

8 Procedure

8.1 Subject each set of five test specimens separately to the procedure given in **8.2** and **8.5**.

8.2 Subject the five test specimens, plus sufficient makeweights (see **5.3**) to give the total dry load specified in table 1 to three consecutive washing procedures in accordance with **5.1**.

8.3 For each wash cycle use a sufficient quantity of the detergent specified in **5.2** to give a final concentration in the wash liquor of 1 g/l.

8.4 Remove the five test specimens from the washing machine and, if necessary, separate the test specimens. Pre-condition and condition the five test specimens in accordance with BS 3424 : Part 2 : 1992 and determine the dimensional stability in accordance with BS 4931 : 1986.

8.5 Note and record any delamination which may have occurred during washing (see **3.1**).

9 Test report

The test report shall include the following particulars:

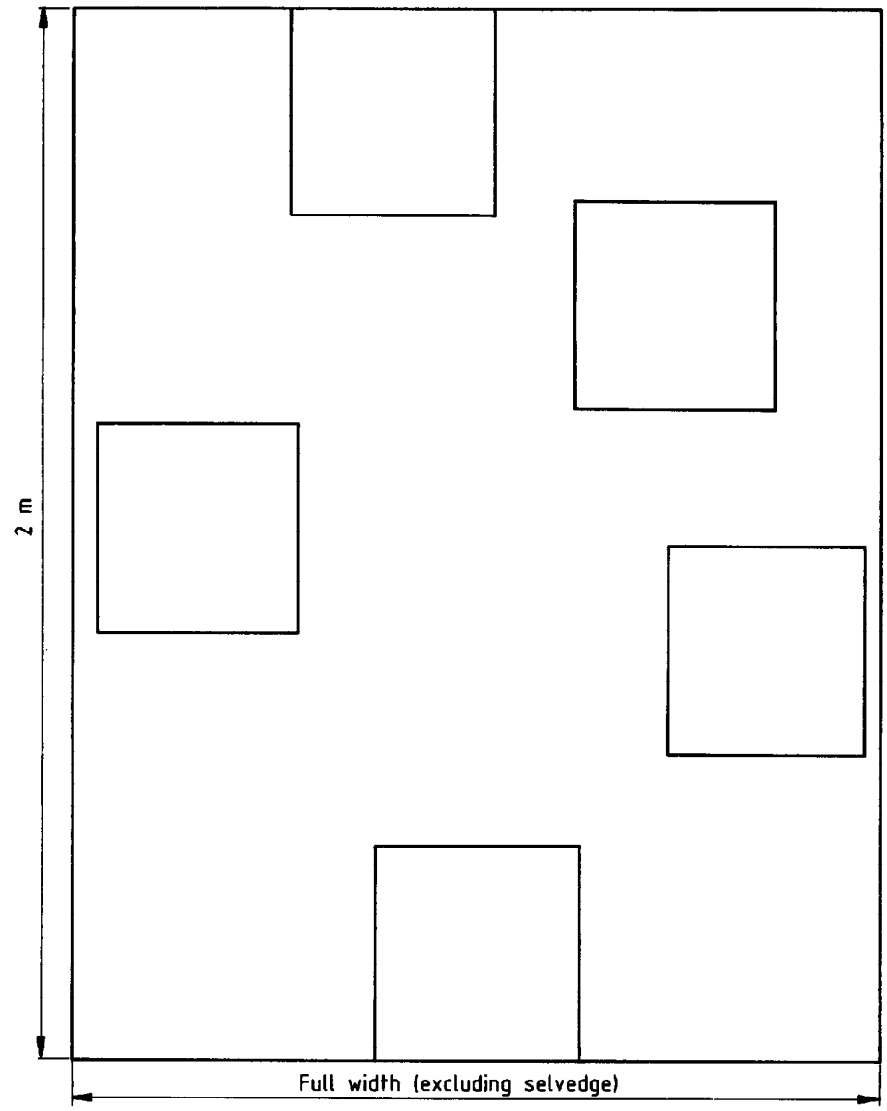
a) a description of the coated fabric;

b) the mean dimensional stability, expressed in the form of a percentage, in both the longitudinal and transverse directions;

c) whether the coated fabric has suffered any delamination;

d) any deviations from the standard test procedure or machine parameters;

e) reference to this method of test, i.e. method 39 of BS 3424 : Part 36 : 1993.



Not to scale.

Figure 1. Scheme for the selection of test specimens

List of references (see clause 2)

Normative references

BSI standards publications

BRITISH STANDARDS INSTITUTION, London

BS 3424 :	*Testing coated fabrics*
BS 3424 : Part 2 : 1992	*Method 4. Pre-conditioning and conditioning of coated fabrics for testing pruposes*
BS 4931 : 1986	*Methods for preparation, marking and measuring of textile fabrics, garments and fabric assemblies in tests for assessing dimensional change*

Informative references

BSI standards publications

BRITISH STANDARDS INSTITUTION, London

BS 1006 : 1990	*Methods of test for colour fastness of textiles and leather*
BS 3424 :	*Testing coated fabrics*
BS 3424 : Part 9 : 1990	*Methods 11A, 11B, 11C and 11D. Methods for determination of resistance to damage by flexing*
BS 4923 : 1991	*Methods for individual domestic washing and drying for use in textile testing*

Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the Plastics and Rubber Standards Policy Committee (PRM/-) to Technical Committee PRM/78, upon which the following bodies were represented:

British Nonwovens Manufacturers' Association
British Plastics Federation
British Railways Board
British Resin Manufacturers' Association
British Rubber Manufacturers' Association Ltd.
British Textile Confederation
British Textile Technology Group
Department of Health
Deparment of the Environment (Building Research Establishment)
Electricity Industry in United Kingdom
Furniture Industry Research Association
Home Office
Industrial Safety (Protective Equipment) Manufacturers' Association
London Regional Transport
Made-Up Textiles Association
Ministry of Defence
National Union of Dyers, Bleachers and Textile Workers (NUDBTW)
RAPRA Technology Ltd.
SATRA Footwear Technology Centre
Society of Motor Manufacturers and Traders Ltd.

The following body was also represented in the drafting of the standard, through subcommittees and panels:

Ministry of Defence

This British Standard, having been prepared under the direction of the Plastics and Rubber Standards Policy Committee, was published under the authority of the Standards Board and comes into effect on
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The following BSI references relate to the work on this standard:
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