BRITISH STANDARD

BS 5690:1991

Method for determination of

Abrasion resistance of fabrics

currently in preview, click buy full versi

NO COPYING WITHOUT BSI PERMISSION EXCEPT AS PERMITTED BY COPYRIGHT LAW

Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the Textiles and Clothing Standards Policy Committee (TCM/-) to Technical Committee TCM/24, upon which the following bodies were represented:

Association of Consulting Scientists
British Nonwovens Manufacturers' Association
British Polyolefin Textiles Association
British Textile Machinery Association
British Textile Technology Group
Confederation of British Wool Textiles Limited
Council of British Cotton Textiles (CBCT)
International Wool Secretariat
Man-made Fibres Producers' Committee
Ministry of Defence
North East Lancashire Textile Manufacturers' Association
SATRA Footwear Technology Centre
Soap and Detergent Industry Association
Society of Dyers and Colourists
Textile Finishers' Association
Textile Institute

urrently in preview, click buy full versi

This British Standard, having been prepared under the direction of the Textiles and Clothing Standards Policy Committee, was published under the authority of the Standards Board and comes into effect on 29 March 199

© BSI 12-19

First pu[illegible]d December 1979
Second [illegible]ition December 1987
Th[illegible]dit[illegible]n March 1991

The following BSI references relate to the work on this standard:
Committee reference TCM/24
Draft for comment 90/37109 DC

ISBN 0 580 19310 1

Amendments issued since publication

Amd. No.	Date	Comments

Contents

		Page
Committees responsible		Inside front cover
Foreword		ii
1	Scope	1
2	Principle	1
3	Apparatus	1
4	Atmosphere for conditioning and testing	2
5	Preparation of test specimens and materials	2
6	Test procedure	2
7	Test report	4
Appendix A Precision of the test		5
Appendix B Method for measuring the indentation hardness of foam		6
Appendix C Method for obtaining the Lissajous figure		6
Figure 1 — Examples of Lissajous figures		7
Table 1 — Reference abradant		2
Table 2 — Time-lapse allowed between examinations		4
Table 3 — Coefficient of variations (expressed as a percentage) based on one standard error estimates		5
Table 4 — Coefficient of variations (expressed as a percentage) of the mean of four samples (based on Table 3)		5
Table 5 — Standard errors calculated		5
Table 6 — Standard errors of the means of four samples (based on Table 5)		5
Publications referred to		Inside back cover

currently in preview, click buy full version

Foreword

This British Standard has been prepared under the direction of the Textiles and Clothing Standards Policy Committee. This edition introduces technical changes to bring the standard up-to-date but it does not reflect a full review of the standard, which will be undertaken in due course. It supersedes BS 5690:1988 which is withdrawn.

The principal change introduced by this new edition is that requirements for calibration of abrasion machines have been revised. Details of the reference materials have also been amended. Data on precision of the test are given in appendix A and a method for measuring indentation hardness of foam is given in appendix B.

The shortcomings of this method are well known, but the test has been used for 30 years. In the development of this standard, considerable attention was given to detail in order to improve reproducibility of the test results.

Fundamentally, the test can be used to monitor differences between batches of a particular fabric or even between fabrics of a similar construction for the same end use.

Much has also been written concerning correlation with wear (*see Textile Institute and Industry*. March 1968:69, and *Journal of the Textile Institute*. 1971. no. 6, 304), and it is stressed that direct correlation is not always obtained with wear trials. Such lack of correlation may reflect the different types of abrasion in the wear trial and the method of test or it may be due to an inherent variability of the wear trial rather than variability of the test. Abrasion in wear is a difficult property to define because of the variation between wearers. Therefore in assessing correlation it is necessary to take account of this variability. It has been reported (*British Knitting Industry*. March 1973:8) that some wearers can "wear out" a "good" fabric in 100 h, whereas at the other extreme a minority of wearers do not cause abrasion wear even on a "poor" fabric after 1 000 h or more.

The committee responsible for preparing the standard stresses that great care and attention to detail is necessary both in performance of the test and in the interpretation of the results of the test.

At the time of publication of this British Standard, no corresponding international standard exists.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

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

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 8, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

currently in preview. Click buy full version

© BSI 12-1998

1 Scope

This British Standard describes a method for determination of the abrasion resistance of flat woven fabrics, knitted fabrics and certain nonwovens. It is not generally applicable to fabrics having a pile longer than 2 mm.

NOTE 1 The use of this method for nonwovens should be agreed between the interested parties.

NOTE 2 The method may not be suitable for easily distorted fabric structures.

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

2 Principle

Circular specimens of fabric are abraded on a reference abradant under known pressure with a cyclic planar motion in the form of a Lissajous figure which is the resultant of two simple harmonic motions at right angles to each other. The resistance to abrasion is estimated by the number of cycles to breakdown or by loss in mass of the specimens.

3 Apparatus

3.1 *Abrasion machine*[1)], of the type described by Martindale (*J. Text. Inst.* 1942:33, T151). The following requirements shall apply to new machines:

Rotational speed of each of the outer pegs	47.5 ± 2.5 r/min
Drive ratio of outer pegs: inner pegs	32 : 30
Total stroke of outer pegs	6[illegible] ± [illegible].5 mm
Total stroke of inner peg	[illegible]0.5 ± 0.5 mm
Face diameter of specimen holder insert	[illegible]8.65 ± 0.05 mm
Parallelism of plate and abrading tables (see note 2)	± 0.05 mm max
Circumferential parallelism (see note 2)	+ 0.05 mm max
Combined total mass of specimen holder, spindle and weight[2)]	595 ± 7 g or 795 ± 7 g

The following requirements shall apply to calibration of machines in use:

Rotational speed of each of the outer pegs (see note 1)	47.5 ± 5 r/min
Lissajous figure dimensions and symmetry (see appendix C)	
a) dimensions	60.0 ± 1.0 mm
b) symmetry	curves shall be parallel and evenly spaced
Face diameter of specimen holder insert	38.65 ± 0.25 mm
Parallelism of plate and abrading tables (see note 2)	± 0.05 mm max
Circumferential parallelism (see note 2)	+ 0.05 mm max
Combined total mass of specimen holder, spindle and weight	595 ± 7 g or 795 ± 7 g

The specimen holders and abrading tables shall be plane and parallel over their entire surfaces. The drive from the motor to the machine shall be connected to a counter and switch so that the revolutions of the outer pegs are indicated and the machine can be stopped after a predetermined number of cycles has been measured by the counter.

NOTE 1 The machine speed should be checked over a period of 5 min using a stop watch. The counter should also be checked to see if it is registering correctly.

NOTE 2 Parallelism should be measured using a dial gauge clamped in turn into each test specimen holder bearing housing. The machine should be switched on and the maximum and minimum readings taken from a dial gauge for each station. The circumferential parallelism of the test piece holder assembly when inserted into each station can be checked by means of appropriate feeler gauges.

NOTE 3 The clamp should be designed to ensure that the abradant and felt can be clamped flat.

3.2 *Reference abradant,* consisting of a crossbred worsted spun, plain woven fabric, complying with Table 1.

[1)] For details of the sources of supply of a suitable abrasion machine and of a suitable reference abradant, felt and polyetherurethane foam, apply to Enquiry Section, BSI, Linford Wood, Milton Keynes MK14 6LE, enclosing a stamped addressed envelope for reply.

[2)] On a working area of 6.45 cm^2, a specimen, spindle (if used on the particular machine in use) and weight of combined total mass 595 ± 7 g or 795 ± 7 g will produce nominal pressures of 9 kPa and 12 kPa respectively.

© BSI 12-1998

currently in preview, click buy full version