

Specification for

**Flammability  
performance of fabrics  
and fabric combinations  
used in nightwear  
garments**

Caractéristiques d'inflammabilité des tissus et  
ensembles de tissus utilisés pour la lingerie de  
nuit — Spécifications

Entflammbarkeit von Geweben und  
Gewebe kombinationen für Nachtbekleidung



## 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/60, upon which the following bodies were represented:

Association for Consumer Research (ACRE)  
 Association of Consulting Scientists  
 British Burn Association  
 British Clothing Industry Association  
 British Nonwovens Manufacturers' Association  
 British Retailers' Association  
 British Textile Confederation  
 British Textile Technology Group  
 Chemical Industries' Association  
 Co-operative Union  
 Consumer Policy Committee of BSI  
 Department of Health  
 Department of Trade and Industry (Consumer Safety Unit, CA Division)  
 Home Office  
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 International Wool Secretariat  
 London Scientific Services  
 Mail Order Traders' Association  
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 National Children's Wear Association  
 Textile Finishers' Association  
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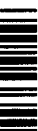
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## Foreword

This British Standard, prepared under the direction of the Textiles and Clothing Standards Policy Committee revises and supersedes BS 5722 : 1984, which remains current pending changes in legislation. It is expected that this edition of BS 5722 will be referred to by amendment to the Nightwear (Safety) Regulations 1985 enabling the 1984 edition to be withdrawn.

NOTE. Upon publication of this revision, BSI Sales Department will respond to purchase orders for BS 5722 by supplying copies of the 1991 edition. Copies of the 1984 edition may be obtained by quoting the number 'BS 5722/84'.

The scope of BS 5722 : 1979 specified performance requirements for sleepwear fabrics and BS 5722 : 1984 extended the scope to include fabrics for dressing gowns. It was stressed in these editions that the requirements applied to fabrics only and should not be used in the description of garments made from these fabrics. It was also pointed out that the use of trims, accessories and sewing threads can have an adverse effect on the flammability of garments. Provisions were made for testing several layers but not for testing other specific features of garment construction.

The present revision has been prepared following publication of a revised version of BS 5438. The new test method now provides facilities for testing fabric and garment specimens by both face and bottom edge ignition using equipment which is also specified in ISO 6941.

The following major changes have been made in this revision.

- (a) The term fabric combination has been introduced in order to avoid the confusion which has arisen because the term fabric assembly was defined differently in the Nightwear (Safety) Regulations 1985, from the definition used in BS 5438.
- (b) Standardized sampling and testing procedures have been specified for fabric combinations taken from garments. The igniting flame is applied to the face, immediately above the bottom edge, of a specimen which incorporates certain garment features, e.g. side seams, bottom hem and sleeves.
- (c) Test results are expressed in terms of combined flammability/durability indices which indicate whether the fabric or the garment has been tested, the level of flammability performance achieved when tested by test 2A or test 3A of BS 5438 and the cleansing procedure in accordance with BS 5651 which has been employed.
- (d) Three different levels of flammability performance are specified for both fabric and garment samples. For normal purposes level 3 is acceptable but it is possible to specify higher performance levels for specific high hazard situations.

As a result of all the changes it is now possible for a fabric or garment supplier to test his production in a standardized manner and to identify it as meeting certain performance levels. It is also possible for purchasers to specify which performance levels are acceptable to them.

It was originally intended to test certain specified garment features using the bottom edge ignition procedure of BS 5438 : 1989 but it was found that, because of the wide variability of garment specimens, it was not possible to apply the flame accurately and consistently to the bottom edge. The face ignition procedure is easier to apply and evaluates the performance of the specified garment features under the same ignition conditions as are used to evaluate the basic fabric.

Some garments include additional features which are not tested using the standard sampling plan. It is not easy to cover all the possible variations in garment design in a test procedure, however, guidance is provided on how such additional features might be tested.

The fabrics and garments covered by this standard are intended to give protection against rapid flame spread arising from accidental contact with small ignition sources. Attention is drawn to the importance of garment design in providing protection from flame. This topic is discussed in PD 2777 and Australian Standard AS 1249.

It is important to note that results obtained using test conditions specified in BS 5438, do not necessarily represent the behaviour of the test material under other conditions of test or use.

Attention is drawn to the Health and Safety at Work etc. Act 1974, and the need to ensure that the tests specified in this standard are carried out under suitable environmental conditions to provide adequate protection to personnel.

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



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# Specification

## 1 Scope

This British Standard specifies flammability performance requirements for fabrics, including multi-layer fabrics and fabric assemblies, for use in the production of sleepwear and dressing gowns, and for fabric samples taken from fabric combinations and garments.

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

## 2 Definitions

For the purposes of this British Standard the following definitions apply.

NOTE. The definitions given in 2.1, 2.2 and 2.3 are intended to distinguish between samples taken from fabrics and samples taken from garments, for testing.

### 2.1 multi-layer fabric

Fabric produced from a series of separate layers, intimately combined at a stage prior to garment production, e.g. quilted fabrics.

### 2.2 fabric assembly

Series of fabrics assembled as they would be at the garment manufacturing stage (excluding threads and trimmings), for the purposes of testing.

### 2.3 fabric combination

Series of fabrics (including threads and trimmings) combined at the garment manufacturing stage.

### 2.4 sleepwear

Nightdresses, pyjamas and other similar garments intended to be worn next to the skin, normally in bed.

### 2.5 dressing gown

Garment primarily intended to be worn over sleepwear but including housecoats and other similar garments.

### 2.6 durability index

Index letter, R, S, T, U, W and X, as specified in clause 5, indicating the specific washing or cleansing procedure to which the test specimen was subjected prior to flammability testing.

### 2.7 flammability index

Code describing the flammability performance of the fabric or garment specimens when tested in accordance with clause 6 and classified in accordance with clause 7.

## 3 Fabric or fabric assemblies sampling

At least one sample shall be taken that is representative of the bulk, of sufficient size to provide the specimens for the test. Three specimens shall be taken in the machine direction and three specimens in the cross direction in accordance with test 2A or test 3A of BS 5438 : 1989.

NOTE. Where multi-layer fabrics or fabric assemblies are tested they should be tested in the arrangement which is to be used in the garment. The order of the layers in the test specimens should be noted in the test report.

## 4 Garment sampling

### 4.1 General

Classification of a garment shall be made on the basis of tests on specimens selected in accordance with 4.2 and 4.3.

NOTE. Manufacturers and retailers should ensure that the frequency of testing ensures that all garments or fabrics comply, irrespective of whether any changes either major or minor, are made to the garment constituents or design.

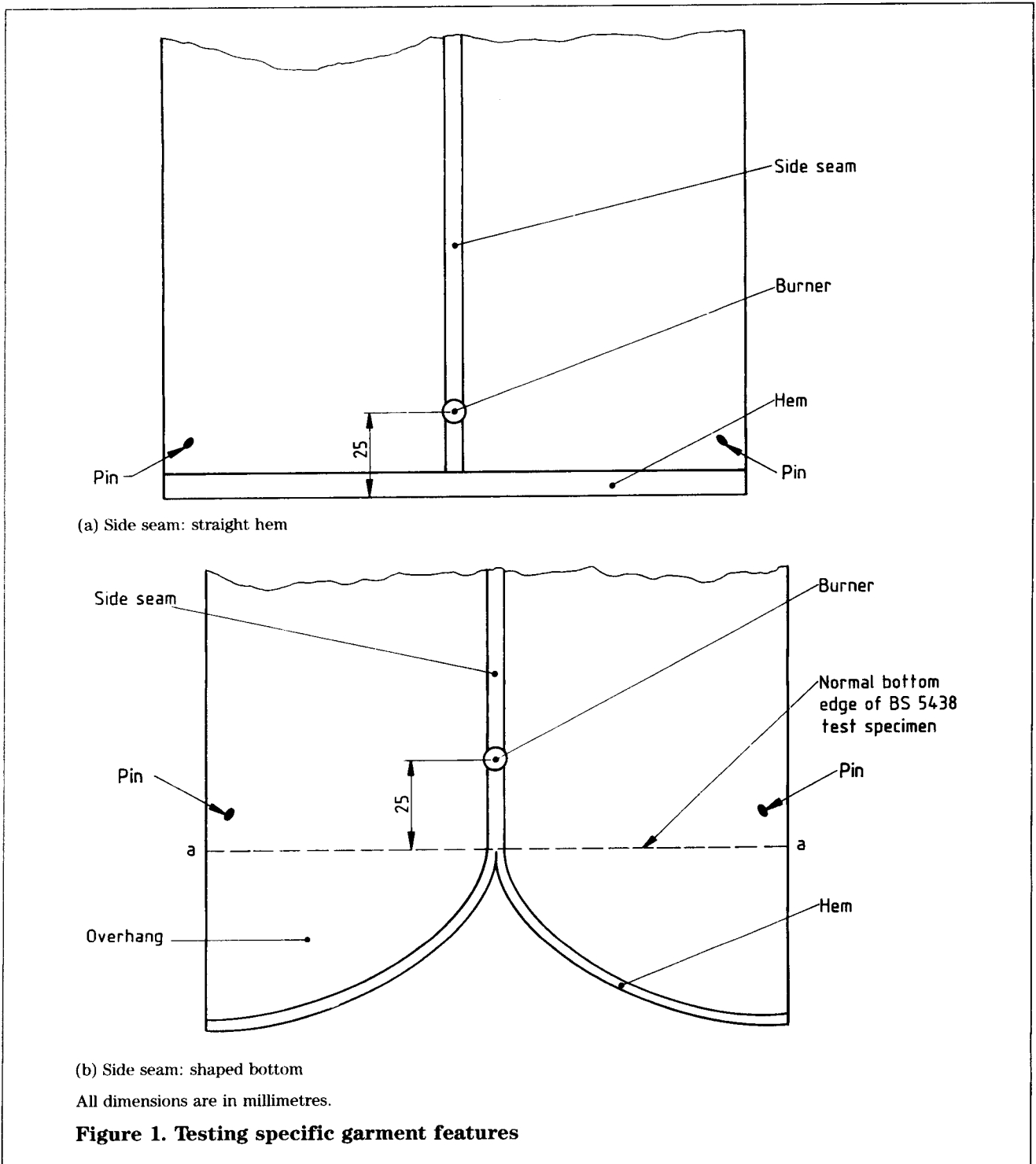
### 4.2 Fabric combinations from garments

Six lengthways specimens shall be tested, these being taken from one or more garments of the type under test.

Each specimen shall incorporate the bottom edge of the combination. Two specimens shall be taken with a side seam in the centre of the test specimen (see figure 1 (a)), one shall be taken from the centre front and one from the centre back, and two shall be taken from the sleeves (see 4.3.7).

NOTE 1. The bottom edge of the test specimen prepared in accordance with BS 5438 is required to be straight. The bottom edge of a garment is frequently not straight; it may be shaped, trimmed or gathered into ruching. It is not easy to describe or illustrate the testing procedure for every possible garment design feature. The general principles employed are illustrated in figure 1.

NOTE 2. Normally, the bottom edge of the garment forms the bottom edge of the test specimen prepared in accordance with BS 5438 (see figure 1 (a) and figure 1 (c)). However, if the bottom edge is not straight, e.g. if it is shaped or ruched, or it has a narrow trim, excess material or trim is allowed to project below the normal bottom edge of the test specimen prepared in accordance with BS 5438 (see figure 1 (b) and figure 1 (d)).



### 4.3 Specific garment features

#### 4.3.1 General

Where the garment incorporates specific features these shall be dealt with in the manner specified in 4.3.2 to 4.3.8, and the fact shall be recorded in the test report.

#### 4.3.2 Overlaps

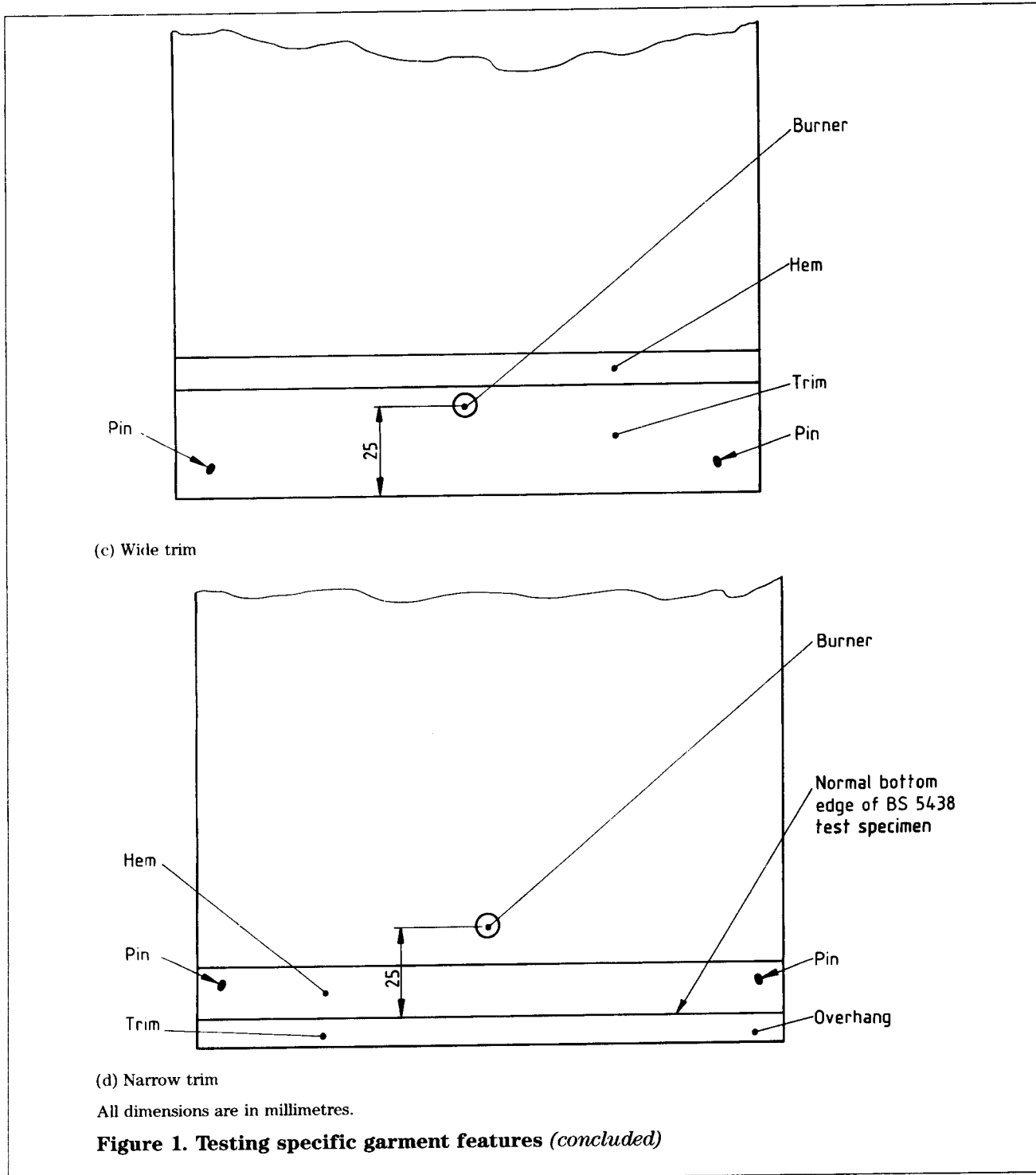
A single outer layer only shall be tested, using the vertical edge of the overlap as one of the vertical edges of the specimen.

#### 4.3.3 Pockets, buttons, labels or trim

If pockets, buttons, labels or trim are incorporated in any test specimens when cut as specified they shall remain in position for testing.

#### 4.3.4 Elastication and ribs

Any separate elastic shall be removed. Ribs shall be stretched to the width of the fabric immediately above the rib.



#### 4.3.5 Trim

Any trim shall be left in position. If edge trim projects more than 5 mm below the bottom edge of the garment, the bottom edge of the trim shall form the bottom edge of the specimen (see figure 1(c)). If edge trim projects less than 5 mm below the bottom of the garment, the specimen shall be cut with the extra length so that the trim projection hangs below the normal position of the specimen's bottom edge (see figure 1 (d)).

#### 4.3.6 Shaped bottom edge

If the garment has a shaped bottom edge, specimens shall be cut with the additional fabric projecting below the normal bottom edge of the BS 5438 test specimen (see aa of figure 1 (b)). This additional fabric and the bottom hem shall be left in position for the test.



#### 4.3.7 Sleeves

Before testing, sleeves shall be opened out by cutting along the seams. Elastication and ribbing shall be dealt with as specified in 4.3.4. Seams shall not be incorporated but cuffs shall be tested as worn.

NOTE. Cuffs may need to be stapled back into position.

If the sleeves are too small to provide specimens at least 200 mm by 160 mm they shall not be tested and two additional specimens shall be taken from the length of the garment.

#### 4.3.8 Belts

Wherever possible, fabric belts shall be of the same type of fabric as the garment itself or of a fabric which complies with the same flammability classification level or better.

NOTE. Belts and cords cannot be tested.

#### 4.4 Features not tested

NOTE. Any trim, prints, motifs or accessories outside the area of flame application on the specimens or flame application specified, may adversely affect the flammability characteristics of the garment under circumstances when ignition is not close to the bottom edge. It is not easy to describe a standardized method of testing such additional features because they are so variable in nature and are frequently small in relation to the required specimen size. However, the effect of major design features may, if required, be evaluated by testing specimens in which the feature is incorporated centrally and with its bottom edge 35 mm above the bottom edge of the specimen, i.e. 10 mm above the burner axis, coinciding with the nominal flame application point.

Any major design features which could affect the basic flammability of the garment shall be noted in the test report.

#### 4.5 Shortage of material

NOTE. Test 2 of BS 5438 describes test specimens 200 mm long by 160 mm wide in a single piece. It is possible to comply with performance level 3 (but not to fail this performance level) using these specimens (see 7.5). Test 3 of BS 5438 describes test specimens 560 mm long by 170 mm wide which can be made up of not more than three pieces.

For the purposes of this standard, the bottom portion of a specimen as described in test 3 of BS 5438 which is in more than one part shall be not less than 200 mm long by 170 mm wide.

If it is not possible to obtain a test specimen of this size incorporating a specified feature, e.g. a sleeve, then that feature shall not be assessed.

If it is not possible to obtain two test specimens 560 mm long by 170 mm wide incorporating a given feature from a single garment, it shall be necessary to use a shorter specimen or to join pieces cut from the same or from different garments of the same type using butt joints held together with five equally spaced staples across the width of the specimen.

### 5 Durability to cleansing

The material shall comply with clause 7 after being cleansed or wetted in accordance with a procedure given in BS 5651 appropriate to the care of the fabric.

The cleansing or wetting procedure used shall be indicated by a durability index letter placed after the flammability index letter (see 7.1). The durability index letters are related to the following references from BS 5651 : 1989:

- (a) R dry cleaning procedure (see clause 4);
- (b) S domestic wash procedure 40 (see 5.5.1);
- (c) T domestic wash procedure 50 (see 5.5.2);
- (d) U commercial laundry procedure (see 6.5.1);
- (e) W hospital laundry procedure (wool) (see 6.5.2);
- (f) X hospital laundry procedure (normal) (see 6.5.3).

NOTE. Where the number of cleansing cycles differs from that given in BS 5651 (normally 12) the actual number may be indicated after the durability code letter, e.g. X 200 indicates that testing has been carried out after 200 washes by the hospital laundry procedure (normal).

### 6 Flammability testing

#### 6.1 Fabric and fabric assemblies

Specimens sampled as specified in clause 3 shall be tested by test 2A or test 3A of BS 5438 : 1989 using a 10 s flame application time.

#### 6.2 Fabric combinations taken from garments

Specimens sampled as specified in 4.2 and 4.3 shall be tested by test 2A or test 3A of BS 5438 : 1989 using a 10 s flame application time.

### 7 Flammability classification

#### 7.1 General

The results of the flammability test shall be expressed as a flammability index. The letter F or G shall be used to indicate whether the fabric (see clause 3) or garment (see 4.2 and 4.3) sampling procedures have been employed. The numerals 1 to 3 shall be used to indicate the level of performance achieved (see 7.2 to 7.5).

#### 7.2 Level 1

For level 1, no part of any hole nor any part of the lower boundary of any flame shall reach the upper edge or either vertical edge of any specimen when tested in accordance with test 2A of BS 5438 : 1989. In addition the mean duration of afterflame plus duration of afterglow shall not exceed 4.0 s.

### 7.3 Level 2

If no part of any hole nor any part of the lower boundary of any flame has reached the upper edge or either vertical edge of any specimen when tested in accordance with test 2A of BS 5438 : 1989 the specimen shall be classified as level 2. If any one specimen does not meet this requirement then a further six specimens shall be tested by test 2A of BS 5438 : 1989 and no part of any hole nor any part of the lower boundary of any flame shall reach the upper edge or either vertical edge of any of the six specimens.

### 7.4 Level 3

If none of the six specimens tested by test 3A of BS 5438 : 1989 sever the second marker thread in less than 30 s or the third marker thread in less than 42 s then they shall be classified as level 3. If any one specimen does not meet any one of these requirements, then a further six specimens shall be tested by test 3A of BS 5438 : 1989. If none of these six specimens sever the second marker thread in less than 30 s or the third marker thread in less than 42 s then these shall be classified as level 3.

### 7.5 Alternative assessments

#### 7.5.1 Use of test 3A to assess compliance with levels 1 and 2

When tested in accordance with test 3A of BS 5438 : 1989, the upper boundary of the specimen described for test 2A shall be marked on the larger specimen and the duration of afterflame and afterglow shall be recorded.

The requirements for levels 1 and 2 shall be as specified in 7.2 and 7.3 respectively.

NOTE. The first marker thread in test 3A of BS 5438 : 1989, which is 245 mm above the lower edge of the test specimen, is sometimes severed although the flame on the fabric itself does not reach the marker thread level. Severance of the first marker thread in test 3A of BS 5438 is not equivalent to burning to the upper edge in test 2A of BS 5438.

#### 7.5.2 Use of test 2A to assess compliance with level 3

If the requirements for level 2 are not achieved when testing in accordance with test 2A of BS 5438 : 1989, but no hole or flame reaches the upper edge of any specimen tested, the fabric or garment shall be classed as complying with level 3. If a hole or flame reaches the upper edge on more than one specimen when testing by test 2A of BS 5438 : 1989 it shall be retested in accordance with test 3A of BS 5438 : 1989 in order to assess whether level 3 can be achieved.

## 8 Test report

The test report shall provide the following information:

- (a) a statement that assessment was carried out in accordance with this standard, i.e. BS 5722 : 1991;
- (b) a full description of the fabric or garment(s) tested and any variations in test procedure because of shortage of material (see 4.3.7 and 4.5);
- (c) the number and type of durability cycles carried out before the flammability testing (see clause 5);
- (d) for each specimen tested, an indication of the specimen type, e.g. length or width for a fabric specimen, seam, front, back or sleeve for a garment specimen;
- (e) for each specimen tested, a record of the observed behaviour as follows:
  - (1) whether the flame or hole reaches the vertical edge;
  - (2) whether the flame or hole reaches the top edge on test 2A or a mark 200 mm above the bottom edge on test 3A;
  - (3) the duration of afterflame;
  - (4) the duration of afterglow;
  - (5) severance time for the second marker thread (for test 3A only);
  - (6) severance time for the third marker thread (for test 3A only);
  - (7) the presence or otherwise of flaming debris;
- (f) the flammability and durability indices achieved (see clauses 5 and 7); or the words 'fails to comply', if appropriate;
- (g) details of any specific sampling procedures (see 4.3);
- (h) a record of any garment design features not tested which may affect the flammability of the garment;
- (i) a record of any garment design features tested which may affect the flammability of the garment.

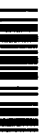
## 9 Identification

A fabric or garment for which compliance with the requirements of this standard is claimed shall be supplied with the following information.

- (a) The manufacturer's name, trademark or other identifying mark.
- (b) For fabrics the statement 'Complies with BS 5722 : 1991<sup>1)</sup>, indices F1/\*, F2/\*, or F3/\*', where \* is the relevant code letter (with or without an additional number) described in clause 5.
- (c) For garments the statement 'Complies with BS 5722 : 1991<sup>1)</sup>, indices G1/\*, G2/\*, or G3/\*', where \* is the relevant code letter (with or without an additional number) described in clause 5.
- (d) Instructions on any special precautions to be taken concerning care, including cleansing of the garment or the fabric, preferably using an appropriate care labelling symbol as given in BS 2747 and taking account of the durability procedure used.

<sup>1)</sup> Marking BS 5722 : 1991 on or in relation to a product represents a manufacturer's declaration of conformity, i.e. a claim by or on behalf of the manufacturer that the product meets the requirements of the standard. The accuracy of the claim is therefore solely the responsibility of the person making the claim. Such a declaration is not to be confused with third party certification of conformity, which may also be desirable.





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**Publications referred to**

- BS 2747 Code of practice for textile care labelling
- BS 5438 Methods of test for flammability of textile fabrics when subjected to a small igniting flame applied to the face or bottom edge of vertically oriented specimens
- BS 5651 Method for cleansing and wetting procedures for use in the assessment of the effect of cleansing and wetting on the flammability of textile fabrics and fabric assemblies
- PD 2777<sup>1)</sup> Fabric flammability burning accidents and the relevance of BS 5438
- ISO 6941<sup>1)</sup> Textile fabrics — Burning behaviour — Measurement of flame spread properties of vertically oriented specimens
- AS 1249<sup>1)</sup> Children's night clothes having reduced fire hazard

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<sup>1)</sup> Referred to in the foreword only.

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