BRITISH STANDARD

BS 6341:1983

Incorporating Amendment No. 1

Specification for

Fabrics for camping tents

UDC 677.074:685.531

Cooperating organizations

The Textile Products and Leather Standards Committee, under whose direction this British Standard was prepared, consists of representatives from the following:

Association of Jute Spinners and Manufacturers
Blanket Manufacturers' Association
British Carpet Manufacturers' Association
British Railways Board
British Textile Employers' Association*
Central Council of the Irish Linen Industry
Consumer Standards Advisory Committee of BSI
Consumers' Association*
Department of Health and Social Security
Department of Industry (Chemicals and Textiles)
Department of the Environment (PSA)
Furniture, Timber and Allied Trades Union
Institute of Purchasing and Supply
Made-up Textiles Association*
Mail Order Traders Association of Great Britain*
Ministry of Defence*
National Association of Retail Furnishers
National Bedding Federation
Textile Institute
Textile Research Council*
Warp Knitters Association Ltd

The organizations marked with an asterisk in the above list, together with the following, were directly represented on the Technical Committee entrusted with the preparation of this British Standard:

Association of Heavy Textile Proofers of Great Britain
Camping Trade Association of Great Britain Limited
Chemical Industries Association
Chief and Assistant Chief Fire Officers' Association
Department of the Environment, Building Research Establishment (Fire Research Station)
Department of Trade
Greater London Council
Home Office
Institution of Fire Engineers
Man-made Fibres Producers Committee

This British Standard, having been prepared under the direction of the Textile Products and Leather Standards Committee, was published under the authority of the Board of BSI and comes into effect on 31 March 1983

The following BSI references relate to the work on this standard:
Committee reference TLM/8
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Amendments issued since publication

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7645	May 1993	Indicated by a sideline in the margin

Contents

Foreword

This standard has been prepared under the direction of the Textile Products and Leather Standards Committee. It is based on the results of a research project carried out by the Shirley Institute and jointly funded by Department of Trade — Consumer Safety Unit and industry and also takes into account the work being carried out in ISO/TC 83 "*Sports and recreational equipment*".

Because fabrics are used in different orientations, from vertical to horizontal, requirements for general properties differ and account of this has been taken by incorporating three classes of fabrics. A fourth class D), is included and is primarily intended for use in the manufacture of tents for MOD use. Requirements for general properties and flammability are equally applicable to all fabrics; where possible requirements for treatment with a preservative process have been linked to BS 2087. However, the processes in that standard may not be applicable to non-cellulosic textiles. For example, it is known that some finishes used to impart water resistance to certain man-made fibre fabrics may be subject to microbiological degradation, whilst the base fabric exhibits considerable resistance to such attack. Therefore use is made of BS 6085 to assess microbiological deterioration. It is accepted that this is a complex, time-consuming standard, and it may be satisfactory to simply prove the system and dispense with the necessity for continued microbiological testing and, instead, to rely on chemical assay of preservative content.

The standard is divided into three sections, Section 1 "General", Section 2 "General properties" and Section 3 "Flammability". In this way, the complete requirements for a particular fabric end use may be selected most appropriately. For example, a ridge tent with a fly sheet might be manufactured from an inner tent fabric meeting the (general and flammability) grade 2 requirements with the outer fly sheet meeting only the (general) grade 9 requirements.

Attention is drawn to the following statement which is required by BS 5438 to be an item of the test report: **"The results may not apply to situations where there is restricted air supply or prolonged exposure to large sources of intense heat as in conflagration"**.

Attention is also drawn to BS 5576 which gives recommendations on means of escape from, and labelling of, tents.

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 6, 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.

Section 1. General

1 Scope

This British Standard specifies requirements for fabrics used in the manufacture of ridge tents and frame tents for camping and is divided into sections so that compliance can be claimed or requested with the whole standard, the requirements for general properties or the flammability requirements only.

Flammability requirements for flooring elements (i.e. groundsheets) are also included, but no additional requirements for groundsheets are given. The flammability requirements for non-flooring elements are also applicable to unsupported plastics film used for windows.

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

2 Definition

For the purposes of this standard the following definition applies.

batch

a definite quantity of fabric manufactured or produced under conditions which are presumed uniform. If different process routes are followed, e.g. different colour ways of a base fabric, the resultant fabrics should be regarded as being from different batches

3 Grading and end use classification

3.1 Grading. The fabric shall be graded as follows:

Grade 1. The fabric complies with class A requirements for general properties (see Table 1) and class E requirements for flammability (see **6.3**).

Grade 2. The fabric complies with class B requirements for general properties (see Table 1) and class F requirements for flammability (see **6.4**).

Grade 3. The fabric complies with class C requirements for general properties (see Table 1) and class E requirements for flammability (see **6.3**).

Grade 4. The fabric complies with class D requirements for general properties (see Table 1) and class G requirements for flammability (see **6.5**).

Grade 5. The fabric complies with class E requirements for flammability (see **6.3**).

Grade 6. The fabric complies with class F requirements for flammability (see **6.4**).

Grade 7. The fabric complies with class H requirements for flammability (see clause **7**) and is for flooring elements only.

Grade 8. The fabric complies with class A requirements for general properties (see Table 1).

Grade 9. The fabric complies with class B requirements for general properties (see Table 1).

Grade 10. The fabric complies with class C requirements for general properties (see Table 1).

NOTE These grades are intended to provide a fabric that will prove satisfactory for the particular part of the tent for which it is used or to provide a tent fabric (grade 4) for more arduous use than is normally encountered by leisure tents. Fabrics complying with the general properties specified in Section 2 are divided into four classes (A, B, C and D) which provide fabrics suitable for different end use orientations as described in **3.2**. The flammability requirements specified in Section 3 are divided into four classes (E, F, G and H). By a combination of these classes grades 1 to 10 are obtained.

3.2 End use classification. Class A, B, C or D fabrics are suitable for use in the following orientations.

Class A: suitable for orientation of approximately 15° with the horizontal (e.g. roofs of frame tents)[1)].

Class B: suitable for orientation of 15° to 75° with the horizontal (e.g. ridge tents)[1)].

Class C: suitable for orientation of over 75° with the horizontal (e.g. walls of frame tents including dividers)[1)].

Class D: which shall be pigmented to shade 298 of BS 381C, is suitable for all non-horizontal orientations, used for MOD purposes.

4 Marking

A fabric for which compliance with this standard is claimed shall be supplied with the following information:

a) the manufacturer's name, trademark or other identifying mark;

[1)] Where an outer and inner tent is employed as one unit, it is satisfactory for only the inner tent to meet the flammability requirements of Section 3. If a tent is manufactured in this way, and the fabric is claimed to comply with this British Standard, then the claim of compliance shall indicate clearly how each fabric part complies.

b) the number of this British Standard, i.e. BS 6341[2)], together with the grade and one of the following statements, as appropriate;

c) for grades 1 to 4, the statement "Including flammability requirements",

for grades 5 to 7, the statement "Flammability requirements only",

for grades 8 to 10, the statement "Excluding flammability requirements".

Section 2. General properties

5 General properties

5.1 Sampling. A sample shall be taken of sufficient size to provide the required test specimens from each finishing batch or from at least every 5 000 m.

5.2 Cellulosic fabric. If the fabric is cellulosic, either natural or man-made, an appropriate treatment from BS 2087 to impart rot resistance shall be applied. Cellulosic fabrics shall meet the requirements of Table 1 without being subjected to the tests in BS 6085.

5.3 Non-cellulosic fabric. Non-cellulosic fabric shall be submitted to the soil burial procedure in BS 6085 and then assessed. The exposed fabric shall then meet the requirements of Table 1 for breaking strength, tear strength and water resistance.

5.4 Non-flooring fabric. Fabrics used in non-flooring shall comply with the requirements of Table 1 depending on the class for which compliance is claimed.

Section 3. Flammability

6 Flammability of non-flooring elements

6.1 Durability to leaching and flexing of flammability performance. Submit a sample (see **5.1**) of sufficient size to provide all the specimens for the flammability tests, to the leaching/flexing procedure specified in BS 5651, then carry out the procedure given in **6.2** and **6.3**, **6.4** or **6.5** as appropriate to the class of fabric.

6.2 Fabric test face. In all cases, carry out a preliminary test in accordance with BS 5438 to ascertain which face of the fabric spreads flame or spreads flame faster. In subsequent tests, test only that face.

6.3 Flammability requirements class E

6.3.1 Fabric shall be tested in accordance with test 2 of BS 5438. Three specimens shall be tested in the machine direction and three in the cross direction, using a 10 s flame application time.

6.3.2 No part of any hole nor any part of the lowest boundary of any flame shall reach the upper edge or either vertical edge of any specimen and there shall be no separation of any flaming debris from any specimen.

6.3.3 In accordance with Appendix B of BS 5438:1976, if any part of any hole or any part of the lowest boundary of any flame reaches the upper edge or either vertical edge of one specimen, or if there is any separation of any flaming debris from one specimen, a further six specimens shall be tested. If all six specimens comply with **6.3.2**, the fabric shall be deemed to comply with the requirements of this standard. If any part of any hole or any part of the lowest boundary of any flame reaches the upper edge or either vertical edge of more than one of the six or twelve specimens tested, or if there is any separation of any flaming debris from more than one of the six or twelve specimens tested, the fabric shall be deemed not to comply with the requirements of this standard.

6.4 Flammability requirements, class F

6.4.1 Fabric shall be tested in accordance with test 3 of BS 5438. Three specimens shall be tested in the machine direction and three in the cross direction using a 10 s flame application time.

Taking the two vertical trip threads as representing one trip thread, in each of at least four specimens not more than one trip thread (i.e. 300 mm or either or both of the vertical trip threads) shall be severed. In either of the two remaining specimens not more than two trip threads (i.e. 300 mm and 600 mm, or 300 mm and either or both of the vertical trip threads) shall be severed. If all three trip threads (i.e. 300 mm, 600 mm and either of the vertical trip threads) are severed on any specimen the fabric shall be deemed not to comply with the requirements of this standard.

NOTE Attention is drawn to the procedure for testing short specimens and to the limitations on the use of results from such specimens (see **11.8** and **11.9** of BS 5438:1976).

[2)] Marking BS 6341 on or in relation to a product is a claim by the manufacturer that the product has been manufactured to the requirements of the standard. The accuracy of such a claim is therefore solely the manufacturer's responsibility. Enquiries as to the availability of third party certification to support such claims should be addressed to the Director, Quality Assurance Division, BSI, Maylands Avenue, Hemel Hempstead, Hefts HP2 4SQ for certification marks administered by BSI or to the appropriate authority for other certification marks.

Table 1 — Requirements for fabrics for camping tents

Test method		Class A	Class B	Class C	Class D
Breaking strength, minimum		warp or weft 50	warp or weft 35	warp or weft 40	warp 240
BS 2576 (daN)		warp + weft 140	warp + weft 80	warp + weft 90	weft 175
Tear strength, minimum	Warp	2.0	1.0	1.5	20[a]
BS 4303 (daN)	Weft	1.5	1.0	1.5	20[a]
Water resistance, hydrostatic head test, minimum BS 2823 (cm)		35	22	22	70
Colour fastness:					
to light and weathering, minimum BS 1006, section B04		5	5	5	6
to water, minimum BS 1006, section E01		—	—	—	shade change 4 staining 4 – 5
Shrinkage, maximum BS 4736 5 cycles, %		4.0	4.0	4.0	1.0
pH aqueous extract, BS 3266		—	—	—	5.0 to 8

[a] Use the tongue tear (double-rip) test specified in BS Handbook 11.

6.4.2 If it is known from previous testing that the fabric can be assessed by test 2 of BS 5438, three specimens shall be tested in the machine direction and three in the cross direction in accordance with test 2 of BS 5438 using 10 s flame application time. No part of any hole nor any part of the lowest boundary of any flame shall reach the upper edge or either vertical edge of any specimen.

In accordance with Appendix B of BS 5438:1976, if any part of any hole or any part of the lowest boundary of any flame reaches the upper edge or either vertical edge of one specimen, test a further six specimens. If all six new specimens comply with the above requirements, the fabric shall be deemed to comply with the requirements of this standard. If any part of any hole or any part of the lowest boundary of any flame reaches the upper edge or either vertical edge of more than one of the six or twelve specimens tested, assessment by test 2 is not sufficient and test 3 shall be used, and the requirements of **6.4.1** shall apply.

6.5 Flammability requirements, class G. The requirements of **6.3** shall apply, except that there shall be no ignition (i.e. less than 1 s duration of flaming), no hole formation and no afterglow.

7 Flammability of flooring element (class H)

7.1 Durability to leaching and flexing of flammability performance. Submit a sample (see **5.1**) of sufficient size to provide all the specimens for the flammability tests, to the leaching/flexing procedure specified in BS 5651, then carry out the procedure given in Appendix A.

7.2 Flammability requirements class H. When tested in accordance with the procedure given in Appendix A, the maximum distance between the centre of the specimen and the edge of the damaged zone shall not exceed 75 mm on any specimen.

Appendix A Flammability test for flooring elements

A.1 General This appendix is based on the test given in BS 6307 but has been modified to allow access of air below the specimen under test. This modification is in agreement with recommendations made in ISO on the same subject.

A.2 Principle. Exposure of a specimen in a horizontal position to the action of a small ignition source (methenamine tablet) under specified conditions and measurement of the resulting damaged length.

A.3 Apparatus and materials

A.3.1 *Test box*, with inside dimensions of 300 mm × 300 mm × 300 mm and made from hard, fire-resistant insulation board with similar thermal properties to asbestos cement board, not less than 6 mm thick. The chamber is open at the top and has a flat removable base made of the same material as above. The joints shall be air tight.

NOTE Any other test chamber giving identical results may be used.

A.3.2 *Square metal plate*, 230 mm × 230 mm, 6.5 ± 0.5 mm thick, with a 205 mm diameter hole cut in the centre of the plate.

A.3.3 *Desiccator(s)*, for storing the methenamine tablets (**A.3.7**). It is recommended that self-indicating silica gel is used as desiccant.

A.3.4 *Glove*, disposable, of polyethylene, polypropylene or rubber.

A.3.5 *Rule*, graduated in millimetres.

A.3.6 *Laboratory fume hood*, of about 2 m^3 capacity, capable of being closed and having its draught turned off during the test. The front or one of the sides of the hood shall be glass in order to permit observation of the specimen during the test.

A.3.7 *Methenamine tablet*[3)], of hexamethylenetetramine, flat, having a mass of 150 ± 5 mg and a diameter of 6 mm.

NOTE Storage of the tablets in a desiccator reduces the tendency to crack upon ignition.

A.3.8 *Supporting frame*, consisting of a steel plate 230 mm × 230 mm × 6 mm with a 205 mm diameter hole in its centre and a 25 mm × 25 mm × 2 mm shim fixed to the underside of each corner to support the specimen above the floor of the test chamber during the test. The edge of the supporting frame shall be cleaned after each test.

A.3.9 *Punch*, capable of making a 6 mm diameter hole in the centre of the test specimen.

A.4 Test specimens

A.4.1 Cut at least eight specimens at random, each 230 mm × 230 mm from each sample and punch a 6 mm diameter hole in the centre of each.

A.4.2 Condition test specimens in the standard atmosphere for testing as defined in BS 1051, i.e. 20 ± 2 °C and 65 ± 2 % r.h. until they are in equilibrium with that atmosphere.

NOTE The specimens should be conditioned in a horizontal plane with the use side up and should not be resting one upon the other.

A.5 Procedure

A.5.1 Carry out the test in an atmosphere having a temperature between 10 °C and 30 °C and a relative humidity between 20 % and 65 %.

A.5.2 Place the test chamber in the laboratory fume hood with the ventilation turned off.

A.5.3 Remove a specimen from the conditioning atmosphere and place it on the supporting frame with the use surface uppermost, ensuring the specimen is horizontal. Place the square metal plate on top of the specimen, and line up the outside edges of the square metal plate, the specimen and the supporting frame.

A.5.4 Place a methenamine tablet flat on the specimen and within 3 mm of the edge of the hole in the centre of the specimen, and ignite the tablet with a lighted match which shall only lightly touch the upper face of the tablet. Do not touch the specimen with the lighted match.

If more than 2 min elapses between removal of the specimen from the conditioning atmosphere or the desiccator and ignition of the tablet, repeat the procedure specified in **A.5.1** to **A.5.4** with a new conditioned specimen. Close the fume cupboard.

If the tablet cracks upon ignition, consider the test result void.

A.5.5 Allow the ignition flame or any propagated flame to burn until extinction or until the flame or glowing reaches the edge of the hole in the metal plate. Terminate the test when either of the above conditions is reached. Stop the timing device, if used. Start the ventilation in the fume hood to eliminate any volatile products of combustion.

A.5.6 After each specimen has been tested, lift the removable base, the square metal plate and the supporting frame from the test chamber and free them of any residue which would prevent the next specimen from lying in a horizontal plane. Allow sufficient time between each test for the test chamber to cool to ambient temperature ± 5 °C.

A.5.7 Repeat the procedure specified in **A.5.3** to **A.5.6** on each specimen.

[3)] For information on the availability of methenamine tablets, apply to Central Enquiries Section, British Standards Institution, enclosing a stamped addressed envelope for reply.

A.5.8 On each specimen measure, to the nearest millimetre, the maximum distance between the centre of the specimen and the edge of the damaged zone using the rule.

A.6 Expression of results. The results of the test shall be the value obtained for each specimen.

A.7 Test report. The test report shall include the following particulars:

a) a statement that the test was conducted in accordance with this appendix to BS 6341;

b) for each specimen, the damaged length as determined in **A.5.8**.

c) any operating detail not stated in this appendix to BS 6341 or any incident likely to have had an effect on the test results.

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Publications referred to

BS 381C, *Specification for colours for identification, coding and special purposes.*

BS 1006, *Methods of test for colour fastness of textiles and leather.*

BS 1051, *Glossary of terms relating to the conditioning, testing and mass determination of textiles.*

BS 2087, *Preservative treatments for textiles.*

BS 2576, *Methods of test for textiles — Woven fabrics — Determination of breaking strength and elongation (strip method).*

BS 2823, *Method of test for the resistance of fabrics to penetration by water (hydrostatic head test).*

BS 3266, *Methods of test for the determination of conductivity, pH, water soluble matter, chloride and sulphate in aqueous extracts of textile materials.*

BS 4303, *Method for the determination of the resistance to tearing of woven fabrics by the wing-rip technique.*

BS 4736, *Method of test for the determination of dimensional changes of fabrics by cold water immersion.*

BS 5438, *Methods of test for flammability of vertically oriented textile fabrics and fabric assemblies subjected to a small igniting flame.*

BS 5576, *Recommendations for safety features for camping tents*[4)].

BS 5651, *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.*

BS 6085, *Methods of test for determination of the resistance of textiles to microbiological deterioration.*

BS 6307, *Method for determination of the effects of a small source of ignition on textile floor coverings (methenamine tablet test).*

BS Handbook 11, *Methods of test for textiles.*

[4)] Referred to in the foreword only.

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