

**BRITISH STANDARD****BS 1771 :  
Part 2 : 1990**

# **Fabrics for uniforms and workwear**

## **Part 2. Specification for fabrics from cellulosic fibres, synthetic fibres and blends**

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## Committees responsible for this British Standard

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Assistant Masters' and Mistresses' Association  
 British Clothing Industry Association  
 British Railways Board  
 British Textile Technology Group  
 Chartered Institute of Marketing  
 Confederation of British Wool Textiles Limited  
 Department of Health  
 Home Office  
 International Wool Secretariat  
 Local Authority Organizations  
 London Regional Transport  
 Mail Order Traders' Association  
 Man-made Fibres Producers' Committee  
 Ministry of Defence  
 National Association of Head Teachers  
 National Children's Wear Association  
 Textile Finishers' Association

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## Foreword

This Part of BS 1771 has been prepared under the direction of the Textiles and Clothing Standards Policy Committee and specifies requirements for fabrics made from cellulosic fibres, synthetic fibres and blends of synthetic fibres with cellulosic fibres. BS 1771 : Part 1 contains requirements for fabrics made entirely from wool or from blends of wool and other fibres.

It was decided to produce a revision of the 1984 edition of BS 1771 : Part 2 to provide a range of fabrics characterized by performance rather than by detailed construction in addition to performance.

This Part of BS 1771 supersedes BS 1771 : Part 2 : 1984 which is withdrawn.

As with the previous edition of this Part of BS 1771, the fabric references allocated to the fabrics listed in tables 1 and 2 have been chosen with the aim of assisting the non-technical purchaser in making a choice of fabric type for his known end-usage.

BS 1771 : Part 2 covers only the basic description of the products and their performance requirements. Purchasing authorities therefore may need to include additional information.

Many properties cannot be specified objectively and cannot therefore be included in the standard. Examples of such properties include colour, handle appearance and details of additional design features. Purchasing authorities may be able to supply standard patterns which cover these properties and which may serve to resolve any ambiguities of description.

**Compliance with a British Standard does not of itself confer immunity from legal obligations. In particular attention is drawn to Statutory Instrument No. 26 1986 Trade Descriptions, the Textile Products (Indications of Fibre Content) Regulations 1986.**

# Specification

## 1 Scope

This Part of BS 1771 specifies minimum performance requirements for a range of woven knitted fabrics made from cellulosic fibres, synthetic fibres and blends of synthetic fibres with cellulosic fibres, suitable for the manufacture of uniforms and workwear garments.

Reference numbers have been allocated to the fabrics listed, with the aim of assisting the non-technical purchaser in making a choice of fabric type for known end-usage.

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

## 2 Definitions

For the purposes of this Part of BS 1771, the definitions given in BS 6189 apply, together with the following.

### 2.1 batch

A definite quantity of some commodity manufactured or produced under conditions which are presumed uniform.

### 2.2 bulk

The total length of fabric included in the contract of supply.

### 2.3 lot

The total number of rolls of fabric included in any part delivery of the bulk.

## 3 Fabric references

Fabrics shall be designated by a condensed technical description containing the following:

- (a) a letter to indicate whether woven (W) or knitted (K);
- (b) a letter or letters to indicate as follows the fibre type, when determined in accordance with BS 4407:
  - C for 100 % cellulosic;
  - CR for an intimate cellulosic fibre and synthetic fibre blend fabric, containing not less than 50 % cellulosic fibre;
  - SR for an intimate cellulosic fibre and synthetic fibre blend fabric, containing less than 50 % cellulosic fibre;
  - PE for 100 % polyester;
  - PA for 100 % polyamide.

(c) a space;

(d) a figure to indicate the minimum mass per unit area in grams per square metre;

(e) a space;

(f) a letter to indicate the colour fastness grade L, M or D;

(g) a letter to indicate the dye type as follows:

A for azoic dye;

H for hydron dye;

K for mineral khaki dye;

S for sulphur dye;

V for vat dye.

NOTE. For example WC 280 LV indicates a woven cellulosic fibre fabric with a minimum mass per unit area of 280 g/m<sup>2</sup>, with colour fastness grade L and vat dyed.

## 4 Fabric performance

Woven fabrics shall comply with table 1. Knitted fabrics shall be raschel warp-knitted and shall comply with table 2.

NOTE 1. Yarns should be evenly spun. Selvages should be firm and straight and of a thickness such as not to lead to unacceptable 'build-up' during laying-up for garment cutting.

NOTE 2. The figures quoted for dimensional change on washing relate to one wash followed by press drying. Successive additional washes, as in actual use, will result in progressive shrinkage and other methods of drying, e.g. tumble drying, may result in a greater shrinkage than that specified.

NOTE 3. Certain types of flame-retardant finish may reduce the strength of fabrics, particularly cellulosic fabrics. Where flame-retardant finishes are used interested parties may agree to specify alternative strength requirements, but such a fabric could not be claimed to comply with this Part of BS 1771.

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**Table 1. Woven fabrics (performance)**

Fibre type reference	Mass/unit area	Breaking strength min.		Tear strength min. warp and weft	Dimensional change on washing max.
		Warp	Weft		
C	g/m <sup>2</sup>	N	N	N	%
	≥ 280	1000	650	30	
	235 to 279	850	550	25	
	190 to 234	700	350	20	
	140 to 189	350	300	—	
< 140	250	250	—		
CR	≥ 280	1200	650	30	± 2
	235 to 279	900	550	25	
	190 to 234	800	400	20	
	140 to 189	600	350	20	
	< 140	250	250	—	
SR	≥ 280	1300	750	30	± 2
	235 to 279	1100	600	25	
	190 to 234	1000	500	20	
	140 to 189	700	400	20	
	< 140	250	250	—	
PE, PA	≥ 280	1300	750	30	± 2
	235 to 279	1100	600	25	
	190 to 234	1000	500	20	
	140 to 189	700	400	20	
	< 140	250	250	20	
Test method	BS 2471 method 5	BS 2576		BS 4303 <sup>1)2)</sup>	BS 5807 <sup>1)</sup>

<sup>1)</sup> After one wash in accordance with procedure 1(A) of BS 4923, followed by press drying at 150 °C.

<sup>2)</sup> Maximum peak method.

NOTE 1. The breaking strength and tear strength figures included in this table reflect and take into account the increasing trend in Europe of using fabrics containing open-end spun yarns.

NOTE 2. The weftwise breaking strength requirements for cellulosic fabric having a mass/unit area of 235 g/m<sup>2</sup> and above allow for the expected loss in strength that will occur in laundering.

**Table 2. Knitted fabrics (performance)**

Fibre type reference	Mass/unit area	Bursting strength min.	Dimensional change on washing
C, CR, SR, PE and PA	g/m <sup>2</sup>	kPa	%
	180 to 280	700	± 2
Test method	BS 2471 method 5	BS 4768 using 30 mm diameter orifice	BS 5807 <sup>1)</sup>

<sup>1)</sup> After one wash in accordance with procedure 4A of BS 4923 followed by press drying at 150 °C.

### 5 Colour fastness

Fabrics shall comply with tables 3 or 4 as appropriate.

NOTE 1. The colour fastness to washing test BS 1006 : section CO6 : test method E2S is a laboratory test to indicate the change of colour on washing.

It does not take into consideration the fluorescent brightening agents (FBAs) which are present in some commercial washing products and which can therefore increase the change of colour.

NOTE 2. Where combinations of fabrics and/or colours are to be used in a garment, reference should be made to the supplier of the fabric for suitability with regard to cross staining.

NOTE 3. Where chlorine containing bleaches are used in laundry processes, reference should be made to the supplier with regard to suitability.

NOTE 4. Certain special colours may not conform to the specified requirements, and reference should be made to the supplier.

### 6 Sampling, testing and compliance

#### 6.1 Sampling

Sampling shall be carried out at the discretion of the testing authority in such a manner that samples taken are representative of the manufacturing, processing, dyeing or finishing batch from which they are drawn.

Samples of the fabric taken for testing for compliance with the requirements of this standard shall be representative of each batch. One sample shall be taken from each 5000 m of fabric or if the batch is less than 5000 m, one sample shall be taken from each batch.

Each sample shall be taken from a different piece and shall be taken from the middle of a dye lot. It shall be large enough to provide material for all the tests required by this standard and shall be identified with the piece or roll from which it was taken.

Colour fastness grade	Dye type	Washing		Water		Rubbing	
		Change of colour	Staining of cotton	Change of colour	Staining of cotton	Dry	Wet
L	Vat	4-5	4	4-5	4	4-5	4
M	Vat	3-4	4	4	4-5	4	2-3
	Hydron	4-5	4	4-5	4-5	4-5	3
	Sulphur	3	2	4-5	4-5	4	2-3
	Azoic	4-5	3	4-5	4-5	4	2
D	Mineral khaki	4	4-5	4-5	4-5	4	3-4
	Vat	3	3	4-5	4	4	2
	Hydron	4-5	2	4-5	4-5	4	2
	Sulphur	2-3	2	4-5	4-5	4	1-2
	Azoic	4	2-3	4-5	3	3-4	1-2
Method of test		BS 1006 : section CO6 : test method E2S		BS 1006 : section EO1		BS 1006 : section X12	

Fibre type	Washing				Water		Rubbing	
	Change of colour	Staining of			Change of colour	Staining	Dry	Wet
		Cotton	Polyester	Polyamide				
CR	4	3-4	3	—	4	4	3-4	2-3
SR	4	3-4	3	—	4	4	3-4	2-3
PE	4	3-4	3	—	4	4	3-4	2-3
PA	4	3-4	—	3	4	4	3-4	2-3
Method of test	BS 1006 : section CO6 : test method E2S				BS 1006 : section EO1		BS 1006 : section X12	

### 6.2 Selection of test specimens

Test specimens shall be selected from the sample taken in compliance with 6.1 in such a manner that the full width and length of the sample is represented in each set of test specimens.

### 6.3 Testing

All the physical tests required shall be carried out on each sample.

Chemical tests and colour fastness tests shall be carried out on one sample from each batch.

### 6.4 Pre-conditioning

Pre-conditioning is not specified prior to testing. However, in the event of any dispute, samples shall be pre-conditioned for 4 h in a relative humidity not exceeding 10 % at a temperature not greater than 50 °C before being exposed to the standard temperate atmosphere for the conditioning and testing of textiles, defined in BS 1051, for at least 24 h before testing.

### 6.5 Re-tests

Should a sample fail any test, two further samples shall be selected from two different pieces in the same batch. Each of these samples shall be tested, and if either fails the whole batch shall be rejected. If both the re-test samples pass, the batch shall be accepted, but the piece from which the failed sample was taken shall not be included in the delivery.

## 7 Marking

Each piece or roll of fabric shall bear the following information, e.g. on a label or swing ticket:

- (a) name, trademark or other means of identification of the manufacturer;
- (b) fabric reference in compliance with clause 3;
- (c) contract number, where applicable;
- (d) piece number;
- (e) length of the piece or roll, in metres;
- (f) width of the fabric, in centimetres;
- (g) the number and date of this British Standard, i.e. BS 1771 : Part 2 : 1990<sup>1)</sup>.

NOTE 1. Interested parties may agree to include the year of manufacture in the marking information.

NOTE 2. To assist in the choice of a suitable fabric, it is recommended that the manufacturer provides the purchaser with the information given in appendix A.

<sup>1)</sup> Marking BS 1771 : Part 2 : 1990 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.



## Appendices

### **Appendix A. Information to be supplied by the purchaser**

The following information should be supplied by the purchaser:

- (a) fabric type, fibre content and reference;
- (b) colour and any special finishing requirements;
- (c) details of any marking or additional design elements;
- (d) packaging instructions;
- (e) instructions for sampling, testing and inspection.

NOTE. Purchasers in some cases may need to specify additional requirements (see foreword).

**Publication(s) referred to**

- 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 1771 Fabrics for uniforms and workwear  
1) Part 1 Specification for fabrics of wool and wool blends
- BS 2471 Methods of test for textiles — woven fabrics — determination of mass per unit length and mass per unit area
- BS 2576 Method for determination of breaking strength and elongation (strip method) of woven fabrics
- BS 4303 Method for the determination of the resistance to tearing of woven fabrics by the wing-rip method
- BS 4407 Methods for quantitative analysis of fibre mixtures
- BS 4768 Method for the determination of the bursting strength and bursting distension of fabrics
- BS 4923 Schedule of domestic washing and drying procedures for textile testing
- BS 5807 Method for determination of dimensional change of textiles in domestic washing and drying
- BS 6189 Glossary of terms relating to fabrics and associated fibres, yarns and processes

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

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