BS 7141 : Part 4 : 1990
UDC 677.074.3 : [677.071.73 : 677.017.4 : 678.4) : 620.1 : 006.3/.8

British Standard

Narrow fabrics

Part 4. Specification for woven elastic webbings containing natural rubber

British Standards Institution

Foreword

This Part of BS 7141 has been prepared under the direction of the Textiles and Clothing Standards Policy Committee. It supersedes BS 1897 : 1971 and BS 4270 : 1974 which are withdrawn, and also incorporates additional fabrics, principally for use in the public sector.

Cross-references are given in appendix A. Information specifically requested by the Ministry of Defence and which was previously contained in Defence Standards is given in appendix B. Appendix C gives additional recommendations, these being product properties which are desirable but which with present technology cannot be specified.

Other Parts of this British Standard are as follows:

Part 1*	Specification for polyamide and polyolefin woven tapes and webbings
Part 2*	Specification for cotton webbings for personal load carrying purposes
Part 3	Specification for wool tapes
Part 5	Specification for elastic flat braids containing natural rubber
Part 6	Specification for laces for boots, shoes and other purposes

Product certification. Users of this British Standard are advised to consider the desirability of third party certification of product conformity with this British Standard based on testing and continuing surveillance, which may be coupled with assessment of a supplier's quality systems against the appropriate Part of BS 5750.

Enquiries as to the availability of third party certification schemes will be forwarded by BSI to the Association of Certification Bodies. If a third party certification scheme does not already exist, users should consider approaching an appropriate body from the list of Association members.

Compliance with a British Standard does not of itself confer immunity from legal obligations. In particular, attention is drawn to The Textile Products (Indications of Fibre Content) Regulations S.I. 1986 No. 26.

*In preparation.

Contents

Specification

1 Scope

This Part of BS 7141 specifies requirements for woven elastic webbings containing natural rubber for use in the public sector and for general use.

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 Part of BS 7141 the following definitions apply.

2.1 mass per unit area (narrow fabric). A characteristic of a narrow fabric which may be calculated according to the following formula:

$$\text{Mass per unit area (in g/m}^2\text{)} = \frac{\text{Mass (in g per 100 m)} \times 10}{\text{Width (in mm)}}$$

2.2 modulus. The force required to extend an elastic narrow fabric by a given extension.

2.3 narrow fabric. Any fabric made by interlacing fibres or yarns which (in the UK) does not exceed 450 mm in width. In the USA and for the purpose of the Combined Nomenclature of the European Community for tariff purposes, the upper limit of width is 300 mm. A characteristic of a narrow fabric is that its edges are an essential feature.

2.4 needleloom. A shuttleless loom in which the weft is drawn from a stationary supply and introduced into the shed in the form of a double-pick by a weft insertion needle. The weft is retained at the opposite selvedge by the action of knitting, or by the introduction of a locking thread from a separate supply.

2.5 needleloom selvedge (NL selvedge). The selvedge opposite to that from which the weft is inserted in a narrow fabric needleloom.

NOTE 1. Usually, this selvedge is formed by knitting together successive double-pick weft loops, sometimes in combination with, or exclusively by means of, a locking thread from a stationary supply. Alternatively, the locking thread may be supplied from a small spool arranged to be passed through the extremities of the weft loops.

NOTE 2. Needleloom selvedge systems are illustrated in figure 1.

2.6 rubber count. The number of threads of a round (cross section) rubber thread which, when placed side by side, measure 25.4 mm, e.g. a round rubber thread of 0.6 mm diameter is termed round count 40. In practice, the count is often expressed as 40/46 meaning a round count of 40, the figure 46 being the count of square (cross section) rubber thread of equivalent cross sectional area. In this standard the rubber threads used are all round in cross section and the counts quoted are the round rubber counts.

2.7 runback. The phenomenon in an elastic fabric in which, when cut, the elastic threads retract from the cut end into the body of the web.

2.8 selvedge. When used without qualification, a longitudinal edge of a fabric formed during weaving, with the weft not only turning at the edges but also passing continuously across the width of the fabric from edge to edge.

2.9 shuttleloom. A weaving machine that uses a shuttle to insert the weft.

2.10 stretch. The extension under a given force of an elastic fabric expressed as a percentage of the original dimension of the fabric.

2.11 weave. The pattern of interlacing of warp and weft in a woven fabric.

2.12 webbing. A woven narrow fabric, the prime function of which is load bearing.

NOTE. Webbing is generally of a coarse weave and often has multiple plies.

3 Materials

3.1 Covered rubber thread

3.1.1 *Rubber thread.* Rubber thread shall be made from vulcanized natural rubber and shall have a maximum relative density of 1.05. Its cross section shall be not less than that of 60 round count when measured by BS 5421.

3.1.2 *Textile covering yarn.* The rubber core shall be covered with four ends of yarn arranged in two spirally opposed layers. Each end of covering shall be not less than 25 tex and shall be made of any fibre or blend having a moisture regain not less than 8.5 %.

3.1.3 *Elongation.* The minimum elongation of a covered rubber thread shall be 160 % under a load of 225 g and shall be at least 30 % greater than the ultimate stretch of the webbing in which it is to be incorporated (see BS 4952).

3.2 Non-elastic yarns

The composition and linear density of the non-elastic warp yarns and weft yarns shall be such that the average moisture regain of the fibres comprising the surface of the webbing is not less than 8.5 %.

4 Construction

4.1 The weave of the webbing shall be double fabric with rigid binder yarns and rubber thread interwoven in both fabrics. Weaving shall be carried out by shuttleloom or needleloom.

4.2 In any 250 mm of finished webbing, each covered rubber thread shall have a minimum of 160 mm of rubber core.

4.3 In the case of fabrics produced on a needleloom, the needleloom selvedge shall be made secure using one of the systems shown in figure 1.

NOTE. The needleloom selvedge should be adequately secure for the end use intended. This means that the structure of the needle-

loom selvedge should give adequate protection against unravelling (see figure 1 in which security increases from system A to system D) and that the catch and lock threads should be adequately strong. (See figure 2 for a recommended spool type interlocking system.)

5 Other requirements

5.1 Fabrics shall comply with the appropriate requirements of table 1.

5.2 Woven elastic webbing used in men's trunk tops shall comply with the following.

(a) The loss of modulus, measured at 50 % extension, shall not exceed 10 % when tested in accordance with method 7A of clause 7 of BS 4952 : 1973 at 120 °C for 4 h.

(b) The length shrinkage as measured by the method in BS 5807 shall not exceed 8 % when tested using wash procedure number 1A of BS 4923 followed by line drying.

(c) The colour fastness shall be a minimum of grade 4 both for change in colour and staining when tested in accordance with test C2S of BS 1006 : C06.

Table 1. Requirements for woven elastic webbing

Reference number	Minimum mass per unit area (measured in accordance with BS 2471)	Minimum mass per unit area of rubber thread (measured in accordance with appendix D)	Minimum stretch (measured in accordance with BS 4952)	Width*
	g/m^2	g/m^2	%	mm
1	1200	350	60	19
2	650	190	100	45
3	650	100	100	35
4	650	150	75	25.5
5	650	70	50	25.5

*Subject to a tolerance of ± 1.5 mm.

6 Sampling

Samples shall not be taken from the first 3 m of textile manufactured. Sampling shall be as follows.

(a) Woven fabrics, loomstate.

(i) For fabrics woven from beams, take one sample from one piece per beam.

NOTE. The quantity of fabric produced from one weaver's beam or from a creel contains the same warp yarns throughout and is woven in one particular form. As such, it constitutes a unique batch or unit of production, provided that weft yarn of substantially consistent quality has been used. If a fresh delivery of weft yarn of unproved quality is introduced during weaving the warp, a fresh batch has been created and further samples for complete fabric tests become necessary. Manufacturers should maintain continuous quality control of weft yarn in respect of the relevant properties, e.g. type of fibre, linear denisty, strength.

(ii) For fabrics woven from creels, take one sample from one piece from each continuously woven length not exceeding 5000 m.

(iii) If several narrow fabrics are woven simultaneously in the same loom, take one sample from each continuously woven length not exceeding 5000 m.

(b) Woven fabrics, piece treated.

(i) For woven fabrics already proved by test in loomstate, take one sample from one piece per finisher's batch per fabric type and manufacturer.

(ii) For woven fabrics not subject to test in loomstate, take one sample from one piece per weaver's beam or each continuously woven length not exceeding 5000 m per finisher's batch.

(iii) If a finisher's batch consists of further pieces from a weaver's beams, or from continuously woven lengths previously proved by test in the finished condition, take one sample from one piece from the finisher's batch.

In the event of dispute, samples shall be pre-conditioned for 4 h at a relative humidity not exceeding 10 % and at a temperature not greater than 50 °C and subsequently exposed to the standard temperate atmosphere for testing textiles as defined in BS 1051 for not less than 24 h, and then tested without removal from that atmosphere.

7 Marking

The webbings shall be provided with a ticket or other means of marking attached to each container and carrying the following information:

(a) the number and date of this Part of BS 7141, i.e. BS 7141 : Part 4 : 1990*;

(b) the reference number of the product in accordance with table 1;

(c) the name, trademark or other means of identification of the manufacturer.

NOTE. For MoD contracts (see appendix B), the information will also include the contract number, the NATO stock number (where appropriate, see table 3), the pattern number (see table 3) and the item name and description (see table 3).

*Marking BS 7141 : Part 4 : 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. Cross-references

Cross-references between the reference numbers specified in this Part of BS 7141, reference numbers in previous standards and previous pattern numbers are given in tables 2 and 3.

Table 2. Cross-references

Reference number	Previous references of products included	Characteristics		
		Mass per unit area	Modulus	Stretch
1	BS 1897 C BS 1897 E	Heavy	High	Low
2	BS 1897 A BS 4270 (and commercial qualities accepted by the public sector)	Medium	High	High
3	(Commercial quality accepted by the public sector)	Medium	Low	High
4	BS 1897 D (and commercial qualities accepted by the public sector)	Medium	High	Low
5	BS 1897 B (and commercial qualities accepted by the public sector)	Medium	Low	Low

Table 3. MoD pattern numbers

Pattern number	Previous pattern number	Width	Reference number
		mm	
9486	NF 503	19	2
9487	NF 504	45	5
9488	NF 509B	35	1
9489	NF 517	25.5	4
9490	NF 509B	25.5	1

Appendix B. Supplementary information for MoD contracts

B.1 Standard patterns

A standard pattern obtainable from the authority named in the tender or contract provides criteria for any properties not specified in this standard.

B.2 Non-compliance

In the event of non-compliance with the specified requirements, any resampling is at the discretion of the Quality Assurance Directorate.

B.3 Delivery format

Rolls should be rolled straight and free from creases. The rolls should be approximately 33 m in length when measured in accordance with BS 1931 after not less than 24 h relaxation. Rolls of not more than two lengths may be accepted provided that the shorter length is not less than 11 m.

B.4 Customer approval

Unless system D is used, samples and thread diagrams of selvedges will be approved by the customers representative before production commences.

Appendix C. Additional recommendations

C.1 General

The main body of the standard contains only objectively verifiable requirements based on well-proven test methods. This appendix gives additional recommendations covering properties which are either subjective or based on as yet unproven test methods.

C.2 Visual faults

The fabric should be free from all visual defects such as stains, holes, slubs, and unevennesses of shade or texture.

C.3 Performance tests

At present, there is insufficient information to permit this standard to be written entirely in terms of objective performance tests. Properties which are not specified directly in this standard but which are important for adequate performance are given in table 4.

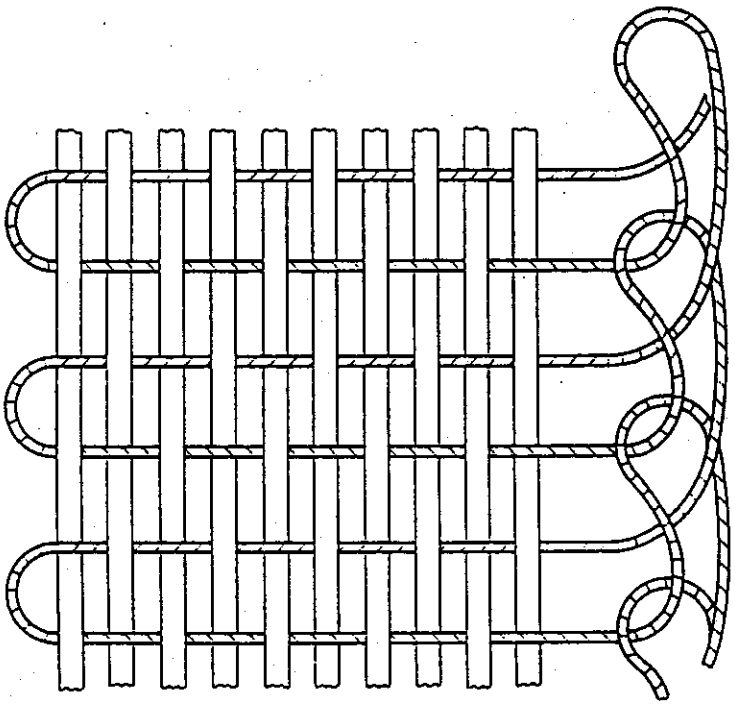
Table 4. Recommended performance tests

Property	Method of test
Breaking strength	BS 2576
Modulus	Clause 7 of BS 4952 : 1973
Tension decay	Clause 8 of BS 4952 : 1973
Runback	Clause 12 of BS 4952 : 1973
Elastic thread durability	Clause 11 of BS 4952 : 1973
Ageing	Clause 13 of BS 4952 : 1973

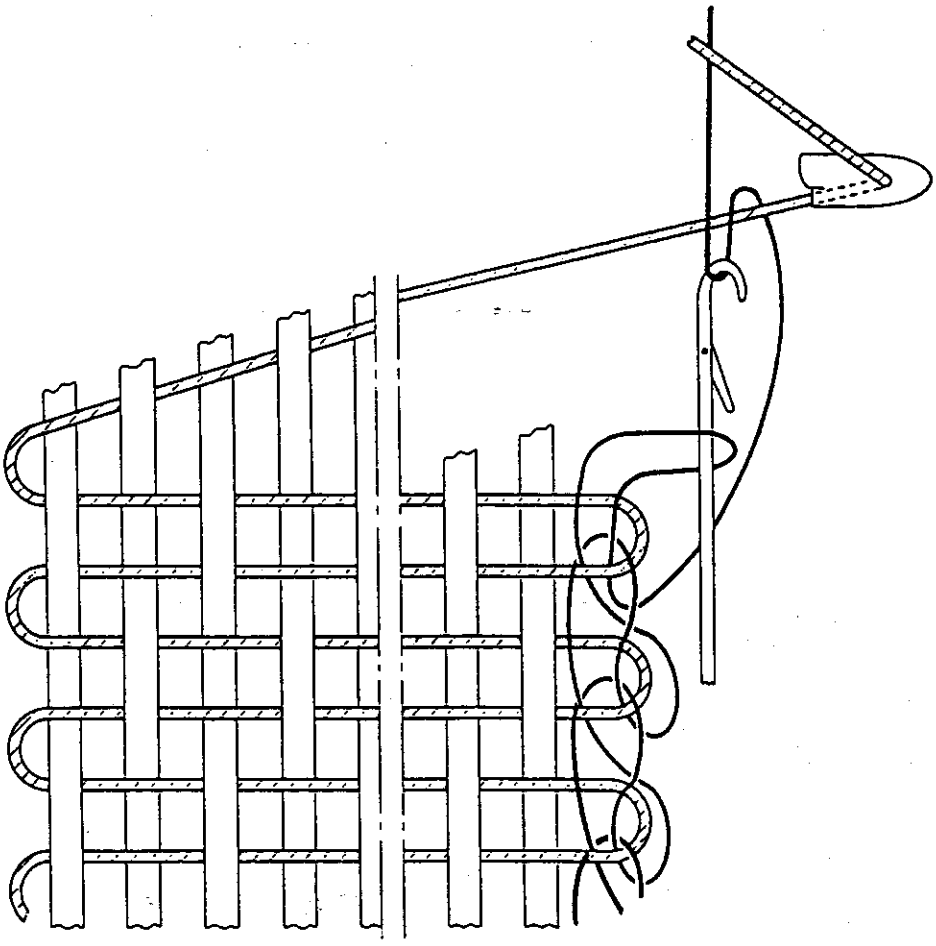
Appendix D. Determination of the mass per unit area of rubber thread in woven elastic narrow fabrics

Follow the procedures in BS 2471 for the determination of mass per unit area using method 3 for sample lengths. After determining the sample dimensions as in clause 6.5.2 of BS 2471 : 1978, unrove the sample, separate the rubber component from the textile component and weigh the rubber component only, as described in BS 2471.

Calculate the mass of rubber in grams per square metre of fabric from which it was removed, and report as grams per square metre of rubber.

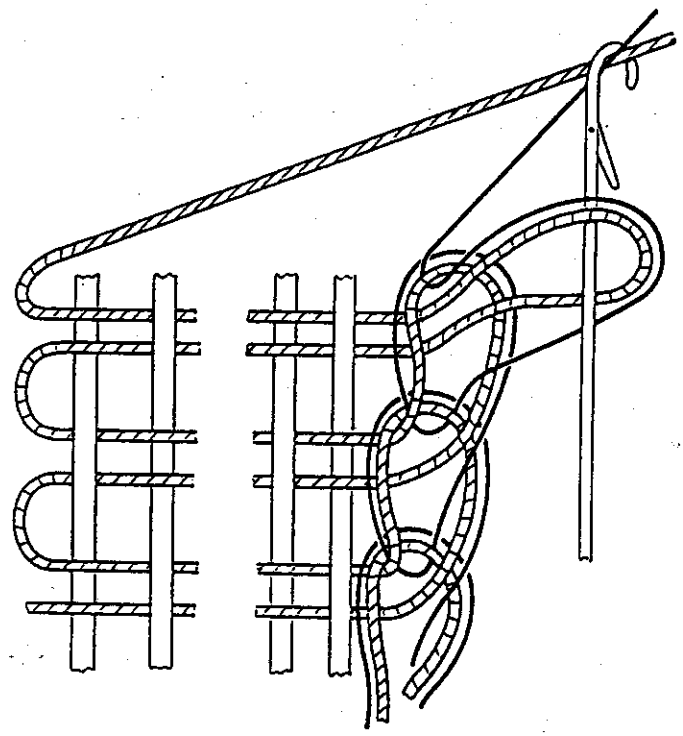


System A

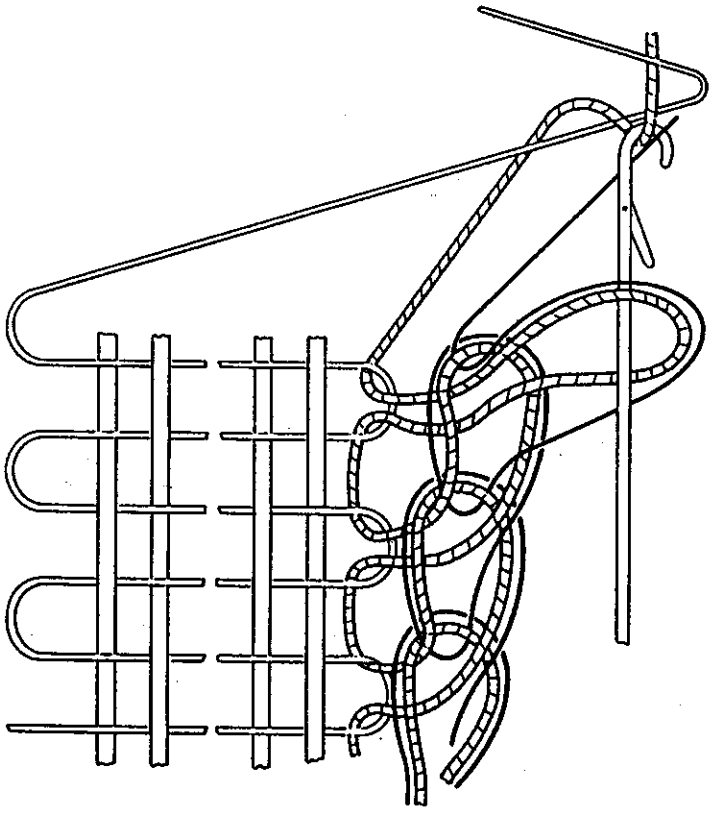


System B

Figure 1. Needleloom selvedge systems



System C



System D

Figure 1. Needleloom selvedge systems *(concluded)*

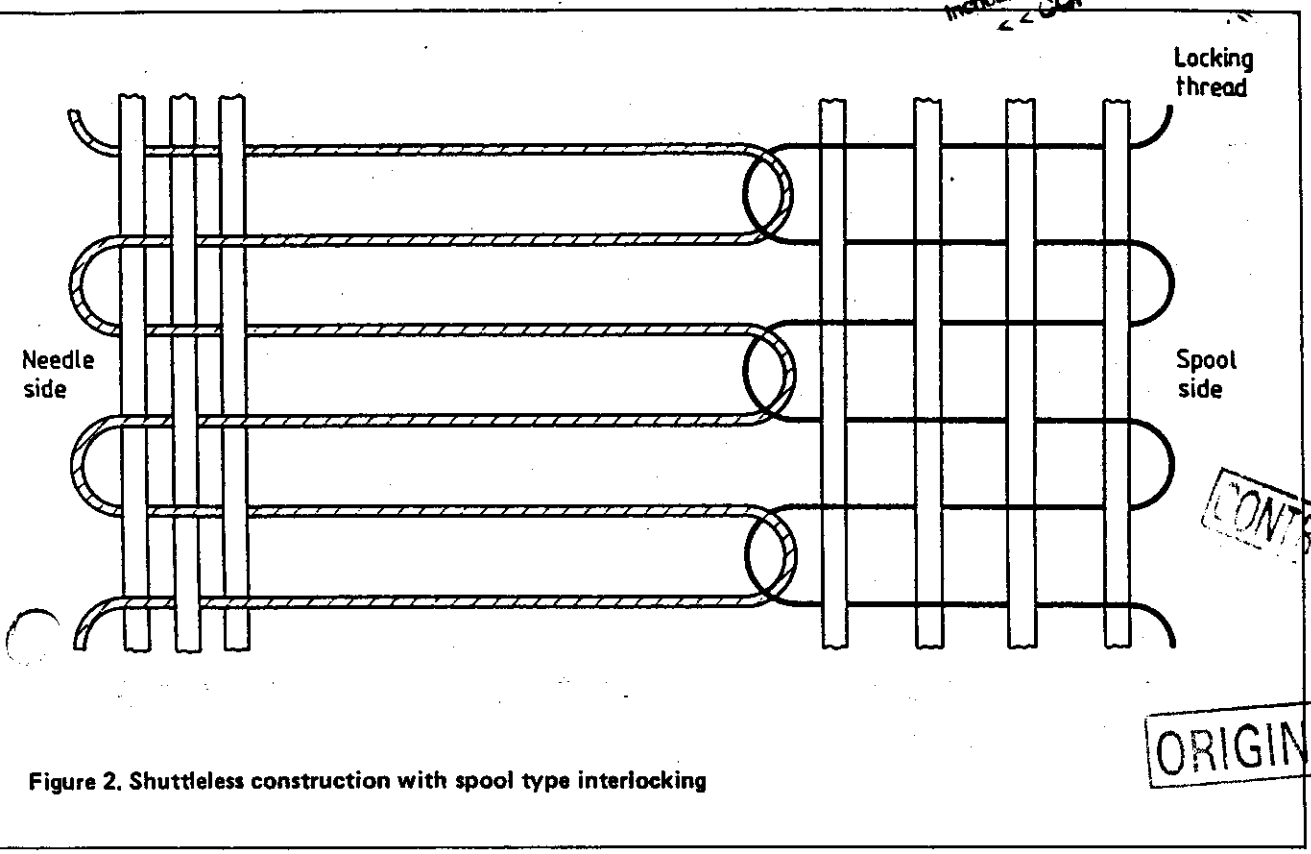


Figure 2. Shuttleless construction with spool type interlocking