AEROSPACE SERIES

BS 3F 129:2003
(Superseding BS 2F 129:1991)

Woven polyester narrow fabrics for aerospace purposes

ICS 49.025.60; 59.080.30

BSI British Standards

Committees responsible for this British Standard

The preparation of this British Standard was entrusted to Technical Committee ACE/21, Narrow woven fabrics for aerospace purposes, upon which the following bodies were represented:

British Narrow Fabrics Association
Ministry of Defence
Society of British Aerospace Companies

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The following BSI references relate to the work on this standard:
Committee reference ACE/21
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Contents

Foreword

This British Standard, prepared under the direction of Technical Committee ACE/21, Narrow woven fabrics for aerospace use, is one of a series for textiles of a quality suitable for aerospace purposes and constitutes a new edition of BS 2F 129:1991, which is withdrawn. It specifies the requirements for a series of polyester narrow fabrics for use primarily in parachutes, life saving equipment and aircrew protective clothing.

It differs from the previous edition in that minimum breaking strengths for some fabrics have been increased (see Table 3).

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its 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 11 and a back cover.

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1 Scope

This British Standard specifies requirements for woven polyester (polyethylene terephthalate) narrow fabrics for aerospace purposes.

NOTE 1 The titles of the publications referred to in this standard are listed on the inside back cover.

NOTE 2 The latest revision of an Aerospace Series standard is indicated by a prefix number.

NOTE 3 The information to be supplied by the purchaser in the contract or order is listed in Annex A.

2 General requirements

In addition to the requirements specified in Clauses **3**, **4**, **5**, **6** and **7** of this standard, the requirements and tests of the latest edition of BS F 100 specified in Table 1 shall apply.

3 Yarn

3.1 Type

The fabric shall be manufactured from bright, continuous filament, polyester (polyethylene terephthalate) yarn.

3.2 Construction

3.2.1 The yarn shall have the nominal construction given in Table 2.

3.2.2 The tolerances on twist shall be ±20 %.

3.2.3 The direction of twist in all fabric designations shall be either all S or all Z. There shall not be different twist directions in the fabric.

4 Manufacture

4.1 The fabric shall be woven either:

a) on a shuttle loom; or

b) on a shuttleless loom where this is in accordance with the appropriate yarn designation as given in Table 2 (see also **4.2**).

NOTE The type of weaving required should be specified in the purchaser's contract or order (see Annex A), but for supply against this British Standard the two types of weaving are considered to be technically equivalent and either may be supplied.

4.2 Shuttleless construction shall not be used unless the appropriate yarn designation as given in Table 2 is required and, if such a yarn is required, the shuttleless construction shall be one of the following:

a) with spool type interlocking in the body of the fabric (see Figure 1 for guidance); or

b) with the weft knitted with one locking thread (see Figure 2 for guidance); or

c) with the weft secured by two knitted locking threads (see Figure 3 for guidance).

4.3 The knitted edge of shuttleless constructions complying with **4.2** b) and c) shall be uniform and even. The edge shall be pulled closely into the body of the fabric to avoid beading.

4.4 Fabric designation 267 shall have a black identifying yarn positioned centrally down the fabric and this shall be included in the total warp ends.

Table 1 — General requirements (given in BS F 100)

Section of BS F 100	Title	Requirements and tests
1	General	All requirements
2	Quality requirements	Requirements for manufacture of narrow fabrics Requirements for dimensions and tolerances Requirements for dyed textiles except those related to fabric intended for coating Requirements for freedom from corrosive impurities (see Section 4 of BS F 100) Requirements for freedom from faults in woven narrow fabrics
3	Physical tests	Test for determination of number of threads per unit length in fabrics Test for the determination of the mass of narrow fabrics Test for breaking strength and extension under force of narrow fabrics Test for dimensional stability on heating: boiling water
4	Chemical tests	If required by Section 2: Test for conductivity of aqueous extract Test for pH value of aqueous extract Test for water soluble chloride Test for water soluble sulfate

5 Finish

5.1 Condition of material

NOTE The condition required should be stated in the purchaser's contract or order (see Annex A).

5.1.1 Fabric designations 296, 5045, 5042, 653, 7849, 201, 206, 267, 5043 and 655 shall be supplied either:

a) scoured; or

b) scoured and dyed.

5.1.2 Fabric designations 7769, 318, 8552, 5044 shall be supplied either:

a) scoured and heat set; or

b) scoured, dyed and heat set.

5.1.3 Fabric designation 5014 shall be supplied scoured, dyed, prestressed and heat set.

After prestressing and heat setting, the extension of the fabric shall not exceed 6 % at an applied force of 4 450 N.

5.1.4 Loomstate fabrics shall not be supplied.

5.2 Dyeing

Where dyeing is required, the colour of either the fabric or the yarns from which it is to be constructed shall be specified either by reference to a British Standard (e.g. BS 381C) or otherwise by pattern.

NOTE The colour required should be stated in the purchaser's contract or order (see Annex A).

6 Properties

6.1 The fabric in the finished state shall comply with **6.2** and Table 3.

6.2 The dimensional stability of heat set fabrics as supplied shall be such that the lengthway shrinkage shall not exceed 3 % in boiling water.

7 Identification

The fabric shall be identified for ordering purposes by the number of this British Standard, i.e. BS 3F 129[1)], together with the appropriate designation and, if required dyed, the colour.

NOTE This identification may be codified. For example, webbing designation 5044, required dyed NATO green, may be identified as BS 3F 129/5044/BS 381C/285.

[1)] Marking BS 3F 129 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.

Table 2 — Yarn construction

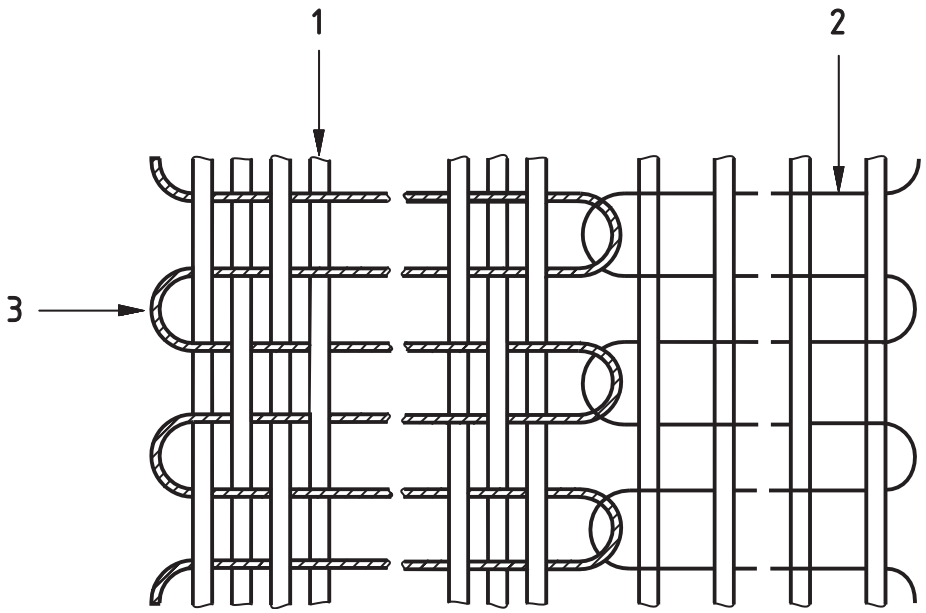
Fabric designation	Warp	Selvedge warp	Binder warp	Weft (conventional)	Weft (shuttleless)	Spool locking thread for shuttleless construction as shown in Figure 1	Lock thread for shuttleless construction as shown in Figure 2	Lock threads for shuttleless construction as shown in Figure 3	
								A	B
7769	1100f192S100			1100f192S100	550f96S100		550f96S100	276f48S160	550f96S100
5014	1100f192S100		276f48S160	1100f192S100					
318	276f64 × 2S160			276f48S160	138f24 flat	—	138f24 flat or 138f24S160	138f24S160	138f24S160
296	1100f192S100		276f48S160	1100f192S100	276f48 × 2S160		276f48S160	276f48S160	276f48S160
5045	1100f192S100		276f48S160	550f96S100	276f48S160		276f48S160	276f48S160	276f48S160
5042	1100f192S100		276f48S160	276f48S160	138f24S160		138f24S160	138f24S160	138f24S160
653	1100f192S100		276f48S160	1100f192 × 2S100					
7849	276f48 × 2S160		276f48S160	276f48 × 2S160 or 550f96S100	276f48S160	—	138f24 flat or 138f24S160	138f24 flat or 138f24S160	138f24 flat or 138f24S160
201	1100f192S100		276f48S160	1100f192 × 2S100	1100f192S100	1100f192S100			
206	1100f192S100	1100f192S100	276f48S160	1100f192S100					
215	1100f192 × 5S100		1100f192S100	1100f192 × 2S100					
267	1100f192 × 2S100	110f192 × 2S100		1100f192 × 2S100					
5043	1100f192S100	1100f192S100	276f48S160	1100f192 × 2S100	1100f192S100		276f48S160	138f24 flat or 138f24S160	276f48S160
665/1	1100f192 × 5S100	1100f192 × 2S100	276f48 × 2S160	1100f192 × 2S100	1100f192S100	1100f192S100			
8552	276f48 × 2S160			276f48S160	138f24 flat	—	74f12 flat	74f12 flat	74f12 flat
5044	1100f192S100			1100f192 × 2S100	1100f192S100		276f48S160	138f24 flat or 138f24S160	276f48S160
655/2	1100f192 × 5S100	1100f192 × 2S100	276f48 × 2S160	1100f192 × 2S100	1100f192S100	1100f192S100			
655/3	1100f192 × 5S100	1100f192 × 2S100	276f48 × 2S160	1100f192 × 2S100	1100f192S100	1100f192S100			

NOTE The tolerance on twist (designated by S for convenience) is ±20 %. The unit for twist is turns per metre.

Table 3 — Fabric construction and properties

Fabric designation	Width (see note 1)	Minimum breaking strength	Ends in width			Picks per 100 mm	Weave	Maximum mass per unit length	Maximum thickness (see note 2)
			Warp	Selvedge	Binder				
	mm	N						g/m	mm
7769	12.5	3 115	63			112 ± 4	2 ply plain tubular	12.0	Not specified
5014	12.5	9 500	138		8	100 ± 8	2 ply plain with 2 ends weaving as one, equidistant binders weaving 1 × 1	20.0	Not specified
318	13 ± 1.0	2 200	72			144 ± 4	2/2 V twill	5.5	Not specified
296	$13\ ^{+1.0}_{-0.5}$	4 000	63		7	120 ± 8	2 ply plain with equidistant binders weaving 1 × 1	10.5	Not specified
5045	20	5 500	83		20	148 ± 4	2 ply plain with equidistant binders weaving 1 × 1	15.0	Not specified
5042	25	8 500	111		27	148 ± 4	2 ply plain with equidistant binders weaving 1 × 1	18.0	Not specified
653	25	10 000	159		19	130 ± 10	2 ply plain with equidistant binders weaving 1 × 1	34.0	Not specified
7849	38	6 000	197		47	236 ± 12	2 ply 2/2 V twill with centre reverse and equidistant binders weaving 1 × 1	22.0	Not specified
201	44	16 500	271		33	125 ± 8	2 ply plain with equidistant binders weaving 1 × 1	61.0	2.9
206	44	26 000	416	15	27	110 ± 10	2 ply plain with two ends weaving as one in the main warp, singly in the selvedge with equidistant binders weaving 1 × 1	69.0	2.4
215	44	26 700	151		18	75 ± 4	2 ply 2 × 1 twill with equidistant binders weaving 1 × 1	126.5	4.8
267	44	33 000	271	11		124 ± 8	See Figure 4	90.0	2.5
5043	45	14 000	208	15	28	146 ± 8	2 ply plain with 2 ends weaving as one in the main warp, singly in the selvedge with equidistant binders weaving 1 × 1	60.0	Not specified
655/1	45	26 700	104	15	28	110 ± 8	2 ply plain with equidistant binders weaving 2 × 2	100.0	Not specified
8552	50	5 000	200			160 ± 8	2/2 twill	18.0	0.5
5044	50	22 000	380			88 ± 4	2/2 twill with 3 reverses 2 ends weaving as one	65.0	Not specified
655/2	50	31 000	120	15	32	110 ± 8	2 ply plain with equidistant binders weaving 2 × 2	120.0	Not specified
655/3	82.5	55 000	208	15	55	110 ± 8	2 ply plain with equidistant binders weaving 2 × 2	195.0	Not specified
NOTE 1. Tolerances are given on the values for width where the requirements differ from those specified in BS F 100.									
NOTE 2. Measured in accordance with BS EN ISO 5084 under a pressure of 21 kPa.									

11 September 2003



Key

1 Warp yarn

2 Spool locking thread

3 Weft yarn

Figure 1 — Shuttleless construction with spool type interlocking

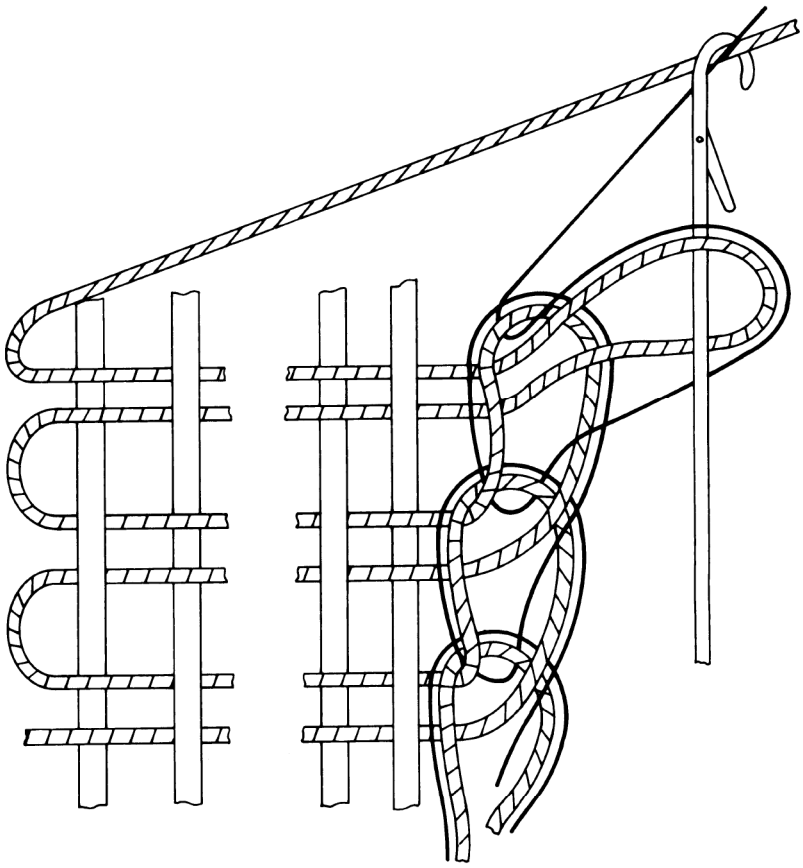


Figure 2 — Shuttleless construction with the weft knitted with a locking thread

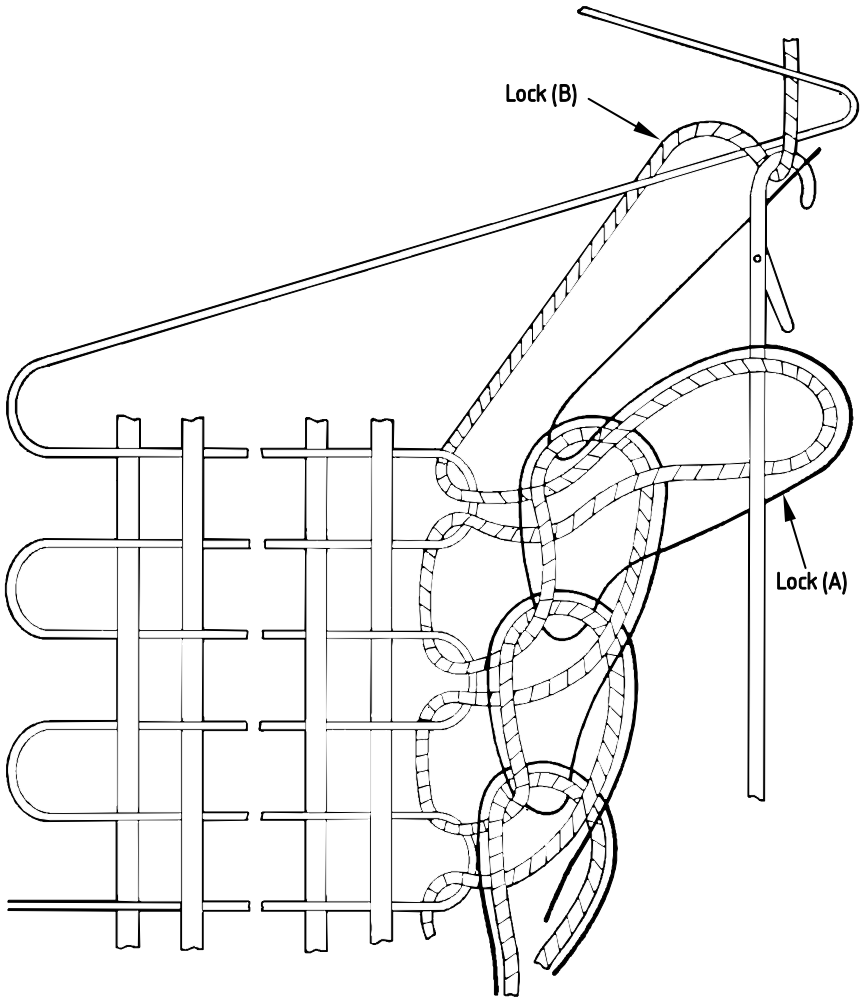


Figure 3 — Shuttleless construction with the weft secured by two knitted locking threads

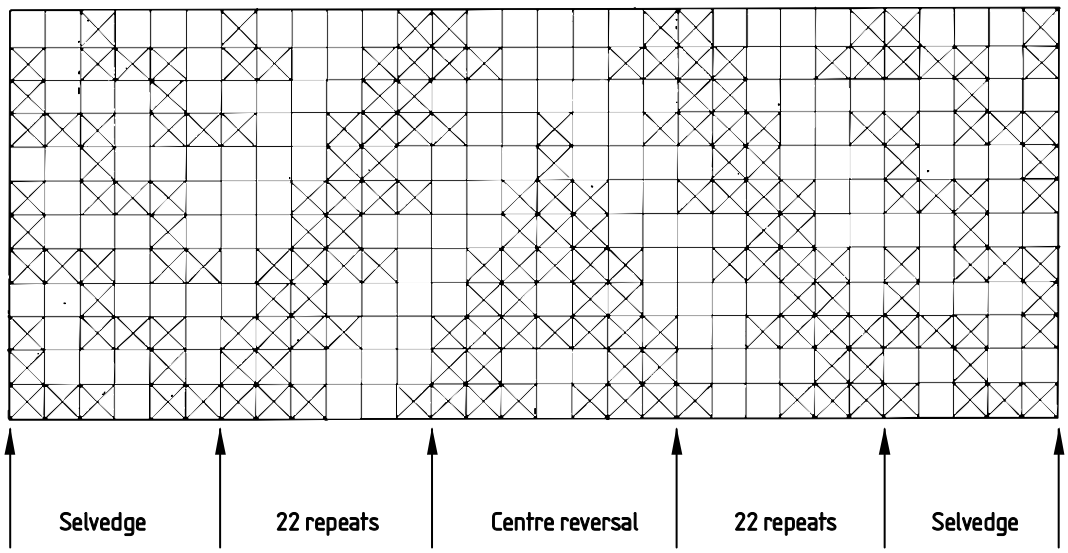


Figure 4 — Weave diagram for webbing No. 267

11 September 2003

Annex A
Information to be supplied by the purchaser

The purchaser should state in his contract or order:

a) the number of this British Standard (i.e. BS 3F 129);

b) the type of weave required (see **4.1**);

c) the condition required (see **5.1**);

d) if required dyed, the colour (see **5.2**).

Publication(s) referred to

BS F 100, *Procedure for inspection and testing of textiles for aerospace purposes.*

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

BS EN ISO 5084, *Textiles — Determination of thickness of textiles and textile products.*

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