BS 3F 128:2010

BSI Standards Publication

Specification for cotton webbing suitable for aerospace purposes (warp yarn nominally R 310 tex)

Publishing and copyright information
The BSI copyright notice displayed in this document indicates when the document was last issued.

ISBN 978 0 580 68999 4

ICS 49.025.60

The following BSI references relate to the work on this standard:
Committee reference ACE/65
Draft for comment 10/30209078 DC

Publication history
First published November 1985
Second edition, April 1992
Third (present) edition, October 2010

Amendments issued since publication

Date	Text affected

Contents

Summary of pages
This document comprises a front cover, an inside front cover, pages i to ii, pages 1 to 10, an inside back cover and a back cover.

Foreword

Publishing information

This British Standard is published by BSI and came into effect on 31 October 2010. It was prepared by Technical Committee ACE/065/-/39, *Textiles for aerospace purposes*. A list of organizations represented on this committee can be obtained on request to its secretary.

Supersession

BS 3F 128: 2010 supersedes BS 2F 128:1992+A1:2002, which is withdrawn.

Information about this document

This British Standard specifies requirements for a range of cotton webbings using a common warp yarn. The webbings can be manufactured using either shuttleless or conventional weaving technology.

This standard has been revised consistently with BS 2F 151 and BS 6F 49 to:

- include new clauses for "Information and requirements to be agreed and documented" and "Terms and definitions", and a new Annex on the determination of Mystox IP™ on fabric; and
- reflect the obsolescence of pentachlorophenyl laurate (PCPL) as a rot-proofing treatment.

Hazard warnings

WARNING. This British Standard calls for the use of substances and/or procedures that can be injurious to health if adequate precautions are not taken. It refers only to technical suitability and does not absolve the user from legal obligations relating to health and safety at any stage.

Use of this document

It has been assumed in the preparation of this British Standard that the execution of its provisions will be entrusted to appropriately qualified and experienced people, for whose use it has been produced.

Presentational conventions

The provisions of this standard are presented in roman (i.e. upright) type. Its requirements are expressed in sentences in which the principal auxiliary verb is "shall".

Where optional recommendations are included, they are expressed in sentences in which the principal auxiliary verb is "should".

Commentary, explanation and general informative material is presented in smaller italic type, and does not constitute a normative element.

Contractual and legal considerations

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 cannot confer immunity from legal obligations.

1 Scope

This British Standard specifies requirements for the yarn, manufacture, finish, construction and identification of cotton webbings for aerospace purposes.

2 Terms and definitions

For the purposes of this British Standard, the following term and definition apply.

2.1 protective treatment
product containing a 50:50 blend of (±)-1-((2-(2,4-dil)-4-propyl-1,3-dioxolan-2-yl) methyl)-1H-1,2,4-triazole and 3-iodo-2-propynyl-butyl carbamate, applied at 0.4% to 0.8% combined actives on weight of fibre

NOTE An example product is Mystox R™[1]. For a relative test method see Annex A.

3 Normative references

The following referenced document is indispensable for the application of this document. The latest edition of the referenced document (including any amendments) applies.

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

NOTE The latest revision of an aerospace standard is indicated by the prefix number.

4 Information and requirements to be agreed and documented

The following information to be supplied by the purchaser shall be fully documented. For compliance with the standard both the definitive requirements specified throughout the standard and the following documented items shall be satisfied:

a) the number of this British Standard, i.e. BS 3F 128;

b) the method of weaving (see Clause **7**);

c) the type of finish required (see **8.1**);

d) the colour, if required dyed (see **8.3**);

e) the width required (see Clause **9**).

5 General requirements

In addition to the requirements specified in Clause **6** to Clause **10**, the requirements and test methods of BS F 100 shall apply (see Table 1).

---

[1] Mystox R™ is proprietary to Catomance Ltd. This information is given for the convenience of users of this standard and does not constitute an endorsement by BSI of the product named. Equivalent products may be used if they can be shown to lead to the same results.

Table 1 **General requirements (given in British Standard F 100)**

Section of BS F 100	Title	Requirements and tests
1	General	All requirements
2	Quality requirements	• Requirements for the manufacture of narrow fabrics • Requirements for dyed textiles except those related to fabric intended for coating • Requirements for dimensions and tolerances • Requirements for freedom from corrosive impurities [A] (see Section 4) • Requirements for freedom from faults in woven narrow fabrics
3	Physical tests	• Test for the determination of the number of threads per unit length in fabrics • Test for the determination of the mass of fabrics • Test for breaking strength and extension under load
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

[A] Applies only to scoured, dyed or rot-proofed fabrics conforming to **8.1**, items b) and c).

6 Yarn

6.1 The webbing shall be manufactured from unsized cotton yarns constructed as specified in Table 2, as appropriate.

Table 2 **Yarn construction** [A), B)]

Webbing designation	Warp	Binders	Weft		Locking threads
			Conventional	Shuttleless	
871	R 310 tex S 270/5	—	R 310 tex S 270/5	R 155 tex S 250/5 or R 155 tex S 400/3	R 30 tex S 900/3 or R 60 tex S 450/2
5505	R 310 tex S 270/5	—	R 310 tex S 270/5		
5506	R 310 tex S 270/5	R 310 tex S 270/5	R 310 tex S 270/5		

[A] Values for twist are given in turns per metre. The direction of twist may be reversed provided that all yarns in weaving have the same direction of twist.

[B] The tolerance on linear density shall be ±5% and that on twist ±10%.

6.2 The yarns shall be ring-spun from carded cotton fibre.

7 Manufacture [see Clause 4, item b)]

7.1 Designation 871 shall be woven 2 and 2 V twill.

7.2 Designation 5505 shall be plain woven with two warp ends weaving as one, except that the selvedges shall each contain not less than three ends woven singly.

7.3 Designation 5506 shall be two-ply plain woven with two warp ends weaving as one, except that the selvedges shall each contain not less than three ends woven singly. Binders shall be spaced equally across the width on one shaft, weaving two up and two down.

7.4 The webbings shall be woven either:

a) conventionally, i.e. in a shuttle loom; or

b) shuttleless.

7.5 Shuttleless constructions shall be woven in accordance with one of the following methods:

a) spool type interlocking in the body of the webbing using the same yarn as the weft (see Figure 1);

b) knitting the weft with a locking thread (see Figure 2);

c) securing the weft by two knitted locking threads (see Figure 3).

7.6 Where shuttleless weaving is used, a pick denotes two threads laid per shed.

7.7 Shuttleless constructions woven in accordance with **7.5**, items b) and c), shall have the interlocked edge pulled closely into the body of the webbing to avoid beading, and shall be uniform and even in appearance.

Figure 1 **Shuttleless construction with spool type interlocking**

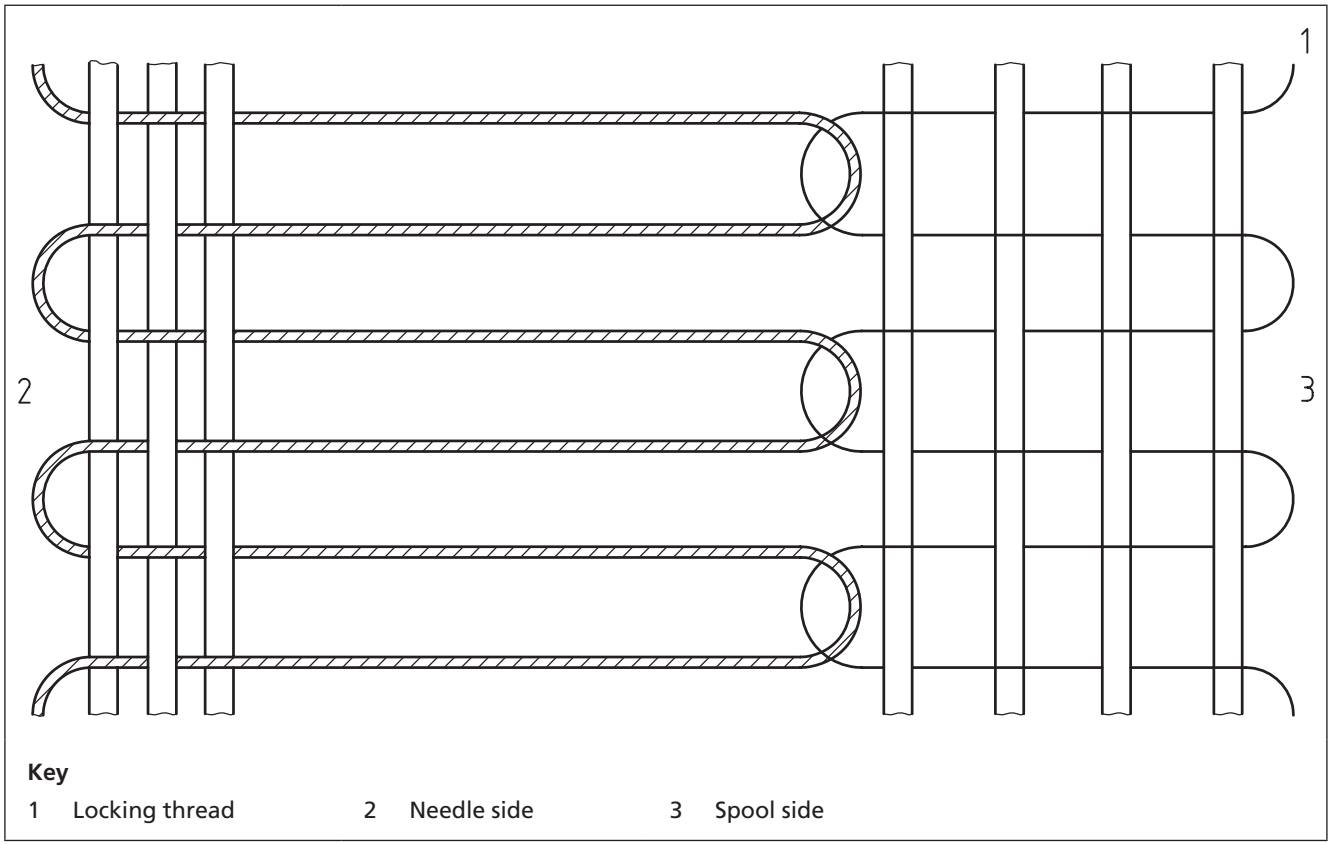


Figure 2 **Shuttleless construction with the weft knitted with a locking thread**

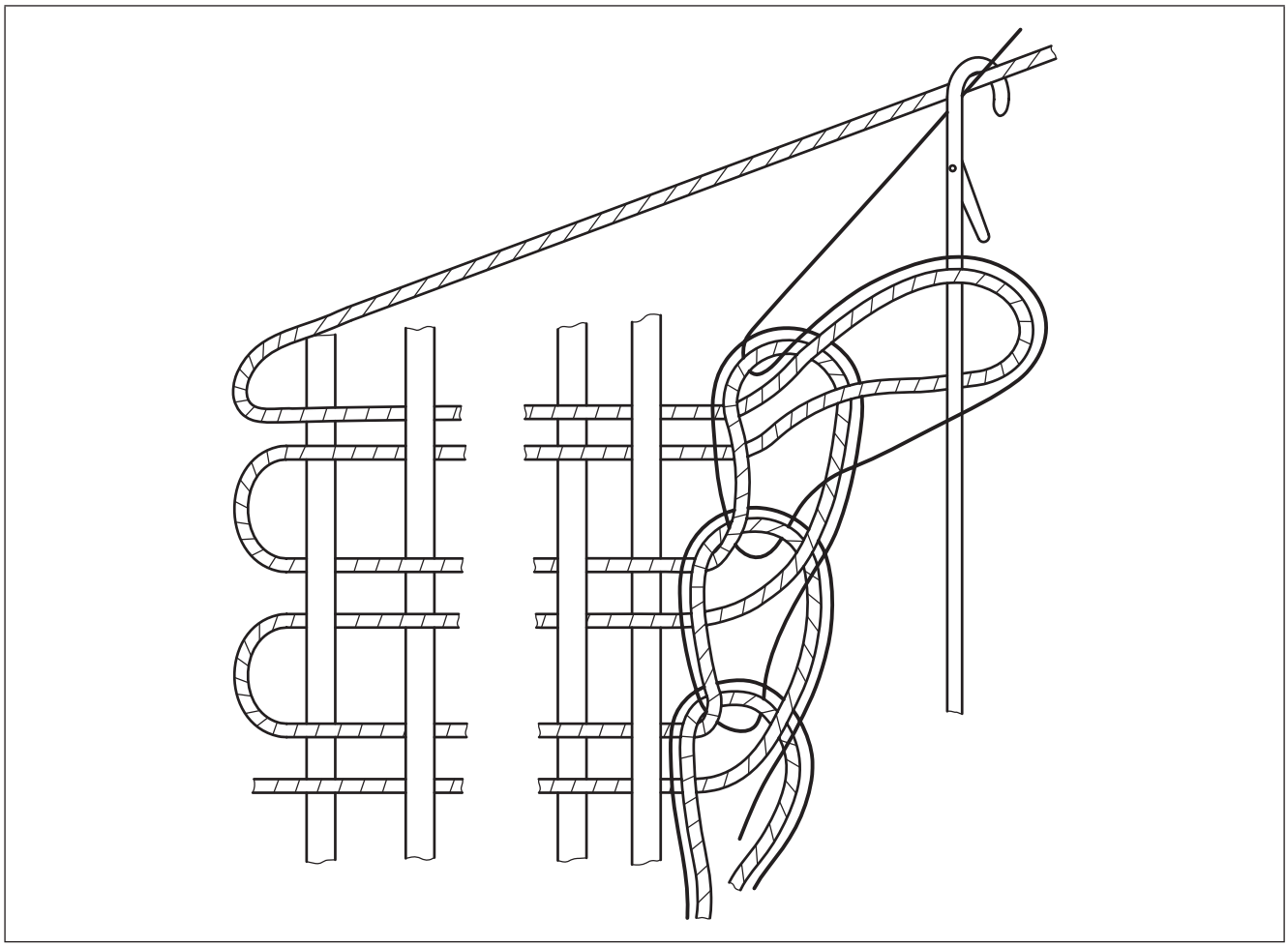
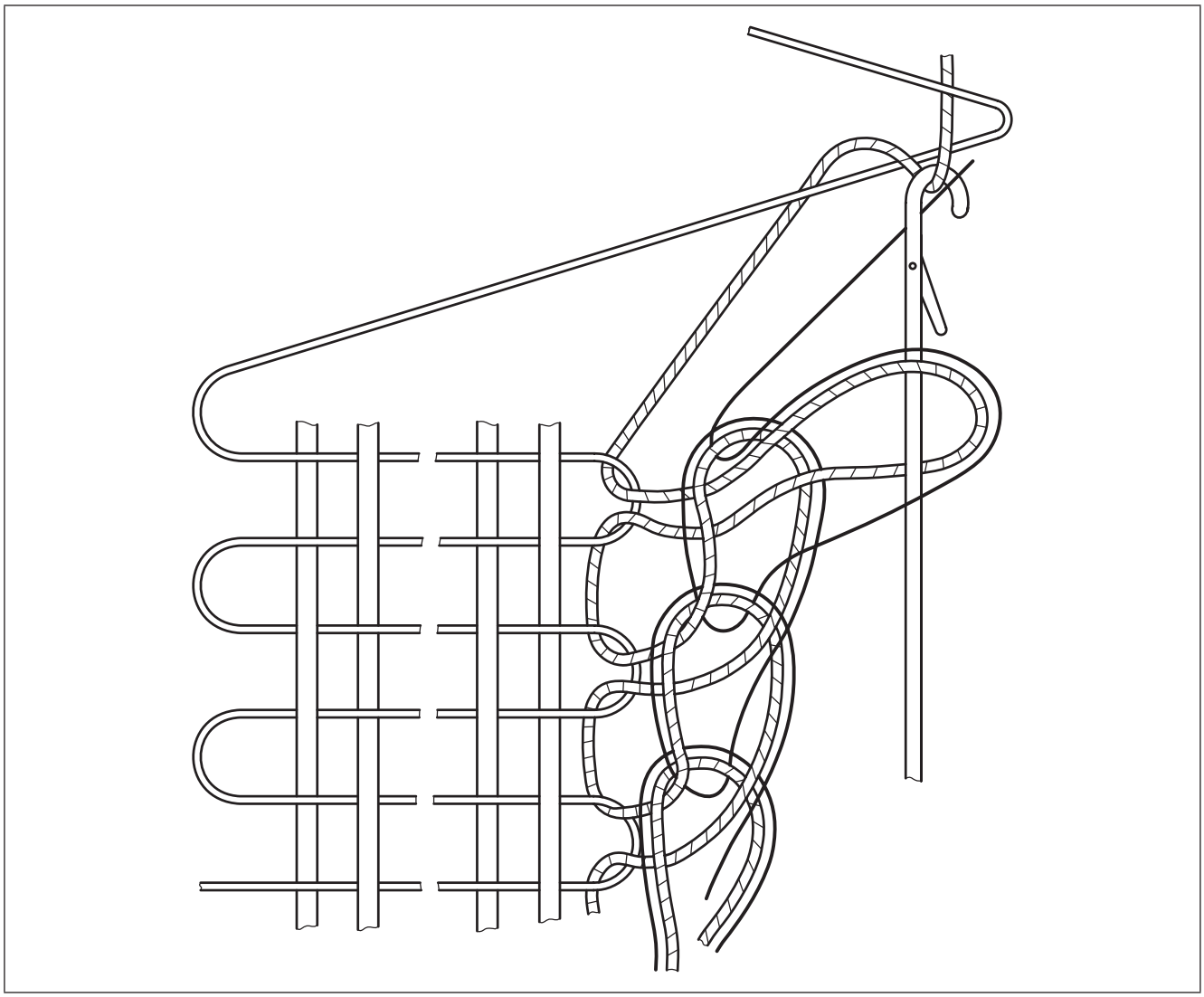


Figure 3 **Shuttleless construction with the weft secured by two knitted locking threads**



8 Finish

8.1 Condition of material

The webbing shall be supplied in one of the following conditions [see Clause **4**, item c)]:

a) loomstate;

b) scoured and rot-proofed (see **8.2**);

c) scoured, dyed and rot-proofed (see **8.2** and **8.3**).

8.2 Rot-proofing

Where the webbing is to be supplied rot-proofed, the webbing or the yarns from which it is woven shall be treated with a protective treatment as described in **2.1**.

8.3 Dyeing

Where dyeing is required, the colour shall be specified by reference to a standard, e.g. BS 381C [see Clause **4**, item d)]. Either the webbing or the yarns from which it is woven shall be dyed.

9 Construction and properties

The webbing in the condition as supplied shall conform to the relevant requirements of Table 3, Table 4 or Table 5 [see Clause **4**, item e)].

Table 3 **Construction and properties of webbing designation 871**

Width	Min. number of ends in width	Picks per 100 mm	Max. thickness [A)]	Max. mass per unit length	Min. breaking strength
mm			mm	g/m	N
45	83	76	1.8	41	2670

[A)] Measured in accordance with BS EN ISO 5084 under a pressure of 21 kPa.

Table 4 **Construction and properties of webbing designation 5505**

Width	Min. number of ends in width	Picks per 100 mm	Max. thickness [A)]	Max. mass per unit length	Min. breaking strength
mm			mm	g/m	N
25	44	63 ±4	1.6	22	1390
50	88	63 ±4	1.6	43	2780
75	132	63 ±4	1.6	65	4150
100	176	63 ±4	1.6	86	5560

[A)] Measured in accordance with BS EN ISO 5084 under a pressure of 21 kPa.

Table 5 **Construction and properties of webbing designation 5506**

Width	Min. number of ends in width		Picks per 100 mm	Max. thickness [A)]	Max. mass per unit length	Min. breaking strength
	Warp	Binder				
mm				mm	g/m	N
12	43	5	122 ±4	2.8	23	1330
20	73	9	122 ±4	2.8	38	2220
25	91	11	122 ±4	2.8	48	2780
38	137	8	122 ±4	2.8	73	4220
50	183	11	122 ±4	2.8	95	5560
75	274	17	122 ±4	2.8	142	8340
100	365	23	122 ±4	2.8	190	11120

[A)] Measured in accordance with BS EN ISO 5084 under a pressure of 21 kPa.

NOTE 12 mm and 38 mm widths are non-preferred widths which should not be used in new designs. These widths will be deleted by amendment when there is no further demand.

10 Identification

The webbing shall be identified for ordering purposes by the number of this British Standard, i.e. British Standard F 128 [2)], together with the appropriate designation and the width, and, if required, the condition of finish specified in Clause **8**.

NOTE This identification may be codified. For example, 50 mm wide webbing dyed olive drab and a rot-proofed product containing a protective treatment may be identified as BS 3F 128 49/50 mm/BS 381C No. 298/.

[2)] Marking BS 3F 128:2010 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 solely the claimant's responsibility. Such a declaration is not to be confused with third-party certification of conformity.

Annex A (informative) The determination of Mystox IP™ on fabric

A.1 Application

To fabrics treated with products containing Mystox IP™ such as Mystox R, Mystox WR and Mystox IP itself.

A.2 Apparatus

A.2.1 *HPLC apparatus* fitted with Lichrosorb RP18 column 10 cm × 4.6 mm ID, detector set at 230 nm UV pump at 2 mL/minute.

A.2.2 *Absorbance 8 × 0.01 integrator* to measure peak areas and retention times.

A.2.3 *HPLC 560 autosampler.*

A.2.4 *2 mL glass vials with PFTE seals and screw caps.*

A.2.5 *Ultrasonic bath set at 75 °C.*

A.2.6 *0.45 µ syringe filters.*

A.2.7 *Calibrated stopwatch.*

A.2.8 *Grade A pipettes.*

A.3 Reagents

A.3.1 *Acetonitrile HPLC.*

A.3.2 *Methanol HPLC.*

A.3.3 *0.05% ammonium carbonate solution.*

A.3.4 *Elution solvent: 50 vol. acetonitrile + 50 vol.*

A.3.5 *0.05% ammonium carbonate solution (mix well before use).*

A.4 Methods

For UKAS accredited tests, ensure that two replicate samples are prepared and the fabric is conditioned for 24 h prior to the test at (20 ±2) °C and (65 ±2)% RH.

Into a 22 mL reaction vessel weigh (0.500 ±0.005) g of diced fabric using a four-figure analytical balance, the calibration check for which is ±0.003 g of the stated calibration weight.

Place pipette in 10 mL of methanol and cap (teflon side down). Wrap PTFE tape around the threads of the bottle and screw cap on securely. Heat the water in the ultrasonic bath. Check the temperature and when it is (75 ±2) °C place the reaction tubes in the bath. Switch on the ultrasonic generator and sonicate for 15 min against a calibrated stopwatch. At the end of this time transfer the vials to a cold water bath for rapid cooling.

Filter the extracts through a 0.45 µ syringe filter into a screw-top glass vial pending HPLC analysis. Wash out the syringe with methanol between samples; do not re-use the methanol. Dispose of the syringe using an environmentally acceptable method.

Wash glassware. Dry and return to the analytical laboratory.

A.5 Standardization

Prepare a strong stock propiconazole containing (10 ÷ Assay %) g of laboratory analysed standard to 100 mL total volume in methanol. This stock is stable for at least three months when stored in a refrigerator. It contains 0.1% propiconazole.

On the day of use prepare sub-dilution of 1 mL stock to 10 mL methanol. This is a 100 mg/L standard.

A.6 Analysis

Switch on the HPLC and associated equipment for ½ hr to stabilize, using elution solvent. Set up and run queue for propiconazole analysis (method 5-13). Program and start autosampler. Record the RT and peak areas for the standard (A_S).

Inject each sample twice and obtain the mean sum for peak areas (A_T).

Follow method 5-12: cleaning procedure for HPLC column. This should be carried out at the discretion of the user if cleaning is thought necessary. Warning signs that cleaning is required include peak splitting, poor peak resolution and baseline variablility.

A.7 Calculation

$$\text{Mystox IP\%} = 0.01 \times \frac{A_T}{A_S} \times \frac{10}{\text{sample weight}} \times 4$$

Bibliography

For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

BS 2F 151, *Specification for shuttleless woven cotton webbing for aerospace purposes*

BS 6F 49, *Specification for shuttle woven cotton webbing 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*

This page deliberately left blank

British Standards Institution (BSI)

BSI is the independent national body responsible for preparing British Standards and other standards-related publications, information and services.
It presents the UK view on standards in Europe and at the international level.

It is incorporated by Royal Charter.

Revisions

British Standards are updated by amendment or revision. Users of British Standards should make sure that they possess the latest amendments or editions.

It is the constant aim of BSI to improve the quality of our products and services. We would be grateful if anyone finding an inaccuracy or ambiguity while using this British Standard would inform the Secretary of the technical committee responsible, the identity of which can be found on the inside front cover.

Tel: +44 (0)20 8996 9001 Fax: +44 (0)20 8996 7001

BSI offers Members an individual updating service called PLUS which ensures that subscribers automatically receive the latest editions of standards.

Tel: +44 (0)20 8996 7669 Fax: +44 (0)20 8996 7001
Email: plus@bsigroup.com

Buying standards

You may buy PDF and hard copy versions of standards directly using a credit card from the BSI Shop on the website **www.bsigroup.com/shop.** In addition all orders for BSI, international and foreign standards publications can be addressed to BSI Customer Services.

Tel: +44 (0)20 8996 9001 Fax: +44 (0)20 8996 7001
Email: orders@bsigroup.com

In response to orders for international standards, it is BSI policy to supply the BSI implementation of those that have been published as British Standards, unless otherwise requested.

Information on standards

BSI provides a wide range of information on national, European and international standards through its Knowledge Centre.

Tel: +44 (0)20 8996 7004 Fax: +44 (0)20 8996 7005
Email: knowledgecentre@bsigroup.com

Various BSI electronic information services are also available which give details on all its products and services.

Tel: +44 (0)20 8996 7111 Fax: +44 (0)20 8996 7048
Email: info@bsigroup.com

BSI Subscribing Members are kept up to date with standards developments and receive substantial discounts on the purchase price of standards. For details of these and other benefits contact Membership Administration.

Tel: +44 (0)20 8996 7002 Fax: +44 (0)20 8996 7001
Email: membership@bsigroup.com

Information regarding online access to British Standards via British Standards Online can be found at **www.bsigroup.com/BSOL**

Further information about BSI is available on the BSI website at **www.bsigroup.com/standards**

Copyright

BSI Group Headquarters

389 Chiswick High Road London W4 4AL UK

Tel +44 (0)20 8996 9001
Fax +44 (0)20 8996 7001
www.bsigroup.com/standards

raising standards worldwide™