BS 8504-2:2006

BRITISH STANDARD

Beach safety flags –

Part 2: Materials – Requirements and test methods

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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.

Foreword

Publishing information

This part of BS 8504 was published by BSI and came into effect on 31 July 2006. It was prepared by Subcommittee PH/8/2, *Public information graphical symbols and signs*, under the authority of Technical Committee PH/8, *Graphical symbols*. A list of organizations represented on this committee can be obtained on request to its secretary.

Relationship with other publications

BS 8504 is published in two parts:

- *Part 1: Colour, shape and meaning;*
- *Part 2: Materials – Requirements and test methods.*

Information about this document

The purpose of BS 8504 is to specify a standardized set of beach safety flags. It is important that beach safety flags are standardized to aid their comprehension. Whilst education in the comprehension of beach safety flags is essential, incomprehension caused by lack of standardization can lead to confusion and possibly danger. International travel increases the need for standardized methods of safety communication.

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".

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 part of BS 8504 specifies the colorimetric and photometric properties and the physical properties, including strength and colour fastness, of materials for the manufacture of beach safety flags.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

BS 2F 127:1991, *Specification for nylon fabrics suitable for coating with natural or synthetic elastomers for aerospace purposes*

BS 5441, *Methods of test for knitted fabrics*

BS EN 1049-2:1994, *Textiles – Woven fabrics – Construction – Methods of analysis – Part 2: Determination of number of threads per unit length*

BS EN 12127, *Textiles – Fabrics – Determination of mass per unit area using small samples*

BS EN 20105-A02, *Textiles – Tests for colour fastness – Part A02: Grey scale for assessing change in colour*

BS EN 20105-A03, *Textiles – Tests for colour fastness – Part A03: Grey scale for assessing staining*

BS EN ISO 105-B02, *Textiles – Tests for colour fastness – Part B02: Colour fastness to artificial light: Xenon arc fading lamp test*

BS EN ISO 105-B03, *Textiles – Tests for colour fastness – Part B03: Colour fastness to weathering: Outdoor exposure*

BS EN ISO 105-E01, *Textiles – Tests for colour fastness – Part E01: Colour fastness to water*

BS EN ISO 105-E02, *Textiles – Tests for colour fastness – Part E02: Colour fastness to sea water*

BS EN ISO 105-X12, *Textiles – Tests for colour fastness – Part X12: Colour fastness to rubbing*

BS EN ISO 13934-1, *Textiles – Tensile properties of fabrics – Part 1: Determination of maximum force and elongation at maximum force using the strip method*

BS EN ISO 13938-1, *Textiles – Bursting properties of fabrics – Part 1: Hydraulic method for determination of bursting strength and bursting distension*

BS ISO 2076, *Textiles – Man made fibres – Generic names*

BS ISO 10526:1999, *CIE standard illuminants for colorimetry*

BS ISO/CIE 10527:1991, *CIE standard colorimetric observers*

CIE 15, *Colorimetry, Third edition*

3 Terms and definitions

For the purposes of this part of BS 8504 the following terms and definitions apply.

3.1 beach safety flag
coloured material that gives a particular safety message by means of a combination of one or more colours and a geometric shape, and is attached by one end to a pole or rope

NOTE A flag can also have additional support, e.g. a horizontal support.

3.2 luminance factor
ratio of the luminance of the surface element in a given direction to that of a perfect reflecting or transmitting diffuser identically illuminated

4 General

4.1 Rectangular flags

The material shall be polyester as defined in BS ISO 2076, and shall be woven or knitted.

NOTE Flags made of knitted polyester are lighter so they dry more quickly and fly better in light wind conditions. However, woven polyester is more durable.

4.2 Conical flags

The material shall be nylon conforming to BS 2F 127:1991, Fabric 7.

5 Colorimetric and photometric properties of material

When the material is tested in accordance with Clause **7** the chromaticity co-ordinates of each colour shall fall within the relevant colour area specified in Table 1. The luminance factor for each colour shall be as specified in Table 1.

NOTE Practical information on colours is given in Annex A.

Table 1 **Chromaticity co-ordinates and luminance factor for beach safety flag materials**

Colour		Chromaticity co-ordinates of corner points determining the permitted colour area Standard illuminant D65 CIE 2° standard observer [A)]				Luminance factor
		1	2	3	4	
Red	x	0.555	0.668	0.710	0.530	$\geqslant 0.07$
	y	0.345	0.332	0.290	0.315	
Orange	x	0.500	0.584	0.640	0.533	$\geqslant 0.18$
	y	0.390	0.416	0.360	0.350	
Yellow	x	0.424	0.465	0.522	0.460	$\geqslant 0.45$
	y	0.479	0.534	0.477	0.430	
White	x	0.385	0.300	0.260	0.345	$\geqslant 0.70$
	y	0.355	0.270	0.310	0.395	
Black	x	0.385	0.300	0.260	0.345	$\leqslant 0.03$
	y	0.355	0.270	0.310	0.395	

[A)] See Clause **7**, Notes 1 and 2.

6 Physical properties of polyester material

6.1 Mass per unit area

When measured in accordance with BS EN 12127, woven polyester shall have a mass per unit area of (155 ± 8) g/m^2 and knitted polyester shall have a mass per unit area of (115 ± 6) g/m^2.

6.2 Threads per unit length in woven polyester

When measured in accordance with BS EN 1049-2:1994, Method B, the mean values of warp ends per centimetre and weft picks per centimetre shall be 13/cm and 12/cm respectively.

6.3 Numbers of wales and courses in knitted polyester

When measured in accordance with BS 5441, the numbers of wales and courses shall be 11/cm and 18/cm, respectively.

6.4 Colour fastness

6.4.1 Colour fastness to light

When the material is tested in accordance with BS EN ISO 105-B02, the colour fastness rating shall be at least 6.

6.4.2 Colour fastness to fresh water

When the material is tested in accordance with BS EN ISO 105-E01, the colour change, assessed using the grey scale given in BS EN 20105-A02, shall correspond to a colour fastness rating of not less than 4-5 and the

staining of adjacent fabrics, assessed using the grey scale given in BS EN 20105-A03, shall correspond to a colour fastness rating of not less than 4-5.

6.4.3 Colour fastness to salt water

When the material is tested in accordance with BS EN ISO 105-E02, the colour change, assessed using the grey scale given in BS EN 20105-A02, shall correspond to a colour fastness rating of not less than 4-5 and the staining of adjacent fabrics, assessed using the grey scale given in BS EN 20105-A03, shall correspond to a colour fastness rating of not less than 4-5.

6.4.4 Colour fastness to wet and dry rubbing

When the material is tested in accordance with BS EN ISO 105-X12, the staining of the rubbing cloths after dry and after wet rubbing, assessed using the grey scale given in BS EN 20105-A03, shall correspond to a colour fastness rating of 5.

6.4.5 Colour fastness to weathering

When the material is tested in accordance with BS EN ISO 105-B03, the colour fastness rating shall be at least 5.

6.5 Strength

6.5.1 Tensile strength of woven material

When tested in accordance with BS EN ISO 13934-1, the maximum forces shall be $\geqslant$1050 N and $\geqslant$825 N in the warp direction and in the weft direction, respectively.

6.5.2 Bursting strength of knitted material

When tested in accordance with BS EN ISO 13938-1, using a test area of 7.3 cm^2 (30.5 mm diameter), the bursting strength shall be $\geqslant$800 kPa.

7 Method for measurement of chromaticity co-ordinates and luminance factor

Measurements of chromaticity co-ordinates and luminance factor shall be made in accordance with CIE 15. The measurements shall be made on a single layer of material backed by a white card with a reflectance greater than 0.75. The material shall be illuminated by standard illuminant D65 as specified in BS ISO 10526:1999, using a spectrophotometer with de:8° geometry incorporating a gloss trap to exclude the specular component of the reflection. The spectrophotometer used shall be one designed to measure reflecting materials, with the data processed to yield CIE x, y, Y data for standard illuminant D65, and the CIE 1931 2° standard colorimetric observer as specified in BS ISO/CIE 10527:1991.

NOTE 1 Standard illuminant D65 represents average daylight.

NOTE 2 The luminance factor is Y/100.

Annex A (informative) Examples of colours

Colours are specified in Table 1 by chromaticity co-ordinates and luminance factor. However, manufacturers of beach safety flag materials might need guidelines concerning what the respective colours look like. For this purpose, and not for colour matching, examples of colours are given in Table A.1.

Table A.1 **Examples for colours which fall within the specified chromaticity co-ordinates and luminance factor**

Colour	BS 5252 colour reference	Pantone® colour reference [A)]
Red	04E53 04E56	—
	—	Red 032C 1788C 1795C 185C **186C** 485C
Orange	06E55	—
	—	021C 1505C 151C 158C 1585C 1595C 165C **166C** 1645C 1655C 1665C 171C 172C 173C
Yellow	08E51 10E51 10E53 10E55	—
	—	Yellow C Yellow 012C 107C 108C **109C** 110C 116C 1235C 124C 130C 136C
White	00E55	—
Black	00E53	—

NOTE Pantone [A)] references in bold indicate preferred colours.

[A)] Pantone® is a trademark owned by Pantone Inc. 590 Commerce Blvd. Carlstadt, NJ 7072-3098 USA. This information is given for the convenience of users of this standard and does not constitute an endorsement by BSI of the product named.

Bibliography

BS 5252, *Framework for colour co-ordination for building purposes*

BS 8504-1, *Beach safety flags – Colour, shape and meaning*

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