

BRITISH STANDARD

Hats – Protection against solar UVR – Method of test and performance requirements

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British Standards

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Foreword

Publishing information

This British Standard was published by BSI and came into effect on 29 September 2006. It was prepared by Technical Committee TCI/66, *Apparel*. A list of organizations represented on this committee can be obtained on request to its secretary.

Information about this document

International research has shown that prolonged exposure of the skin to the sun can produce both short and long term harm to the individual. Hats are an important part of protection from solar ultraviolet radiation (UVR) in shielding the head, neck, face and eyes from direct sunlight. Unlike clothing, the exposed areas of the face, neck and eyes can be exposed to reflected light from the surroundings.

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 British Standard specifies minimum ultraviolet transmission requirements for materials used in the construction of hats worn to give some protection from solar ultraviolet radiation. Requirements for dimensions, design and labelling are also included in the standard.

NOTE Babies up to six months are not adequately protected by hats and should be fully shielded from the sun by other suitable means.

2 Normative references

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

BS EN 13758-1:2002, *Textiles – Solar UV protective properties – Method of test for apparel fabrics*

BS EN ISO 139, *Textiles – Standard atmospheres for conditioning and testing*

3 Terms and definitions

For the purpose of this British Standard, the following terms and definitions apply.

3.1 hat

article of clothing designed to be worn on the head

3.2 solar ultraviolet radiation

electromagnetic radiation with a wavelength between 290 nm and 400 nm

3.3 ultraviolet protection factor

UPF

ultraviolet protection factor as determined by BS EN 13758-1:2002

3.4 head

head including the back of the neck down to the nape

3.5 peak

shaped piece of material usually stiffened and attached to the front of a hat

3.6 brim

piece of material attached to the hat usually stiffened and circling the whole hat

NOTE See Figure 1.

NOTE See Figure 2.

4 Fabric performance (UPF)

The fabric or fabric combinations used to construct a hat shall have a minimum UPF transmission of 50 when tested in accordance with Annex A. Where multiple layers are used, these shall be tested as a composite.

5 Design features

5.1 Style

NOTE Hats of any design will give some protection from solar ultraviolet radiation. However, areas of the head, neck and face not directly covered can be exposed to direct and reflected solar ultraviolet radiation. Simple caps are inadequate.

The hat shall be a legionnaire style cap (5.4) or a simple full brim style hat (5.5).

5.2 Continuous coverage

There shall be continuous coverage of fabric over the dimensions specified in Table 1 and Table 2.

5.3 Eyelets

Open unshielded eyelets shall be no greater than 3 mm diameter, with no more than 10 in total and set no closer than 10 mm between centres.

5.4 Dimensions of legionnaire style cap

The dimensions of legionnaire style cap shall be as shown in Figure 1 and Table 1. The circumference of the cap a shall be the prime dimension.

5.5 Dimensions of simple full brim style hat

The simple full brim style hat shall be as shown in Figure 2 and Table 2. The circumference of the hat a shall be the prime dimension.

Figure 1 Legionnaire style cap

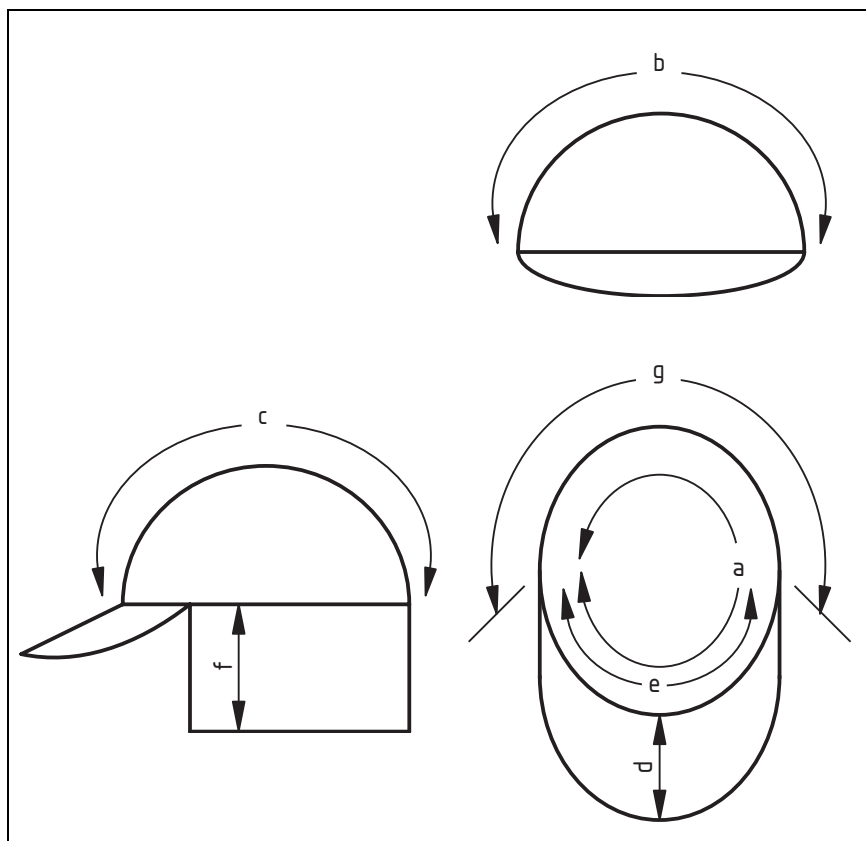


Table 1 Legionnaire style cap

Measurement		Infant 6 to 36 months	Child 3 to 7 years	Child 7 to 14 years	Adult
Circumference of hat	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>
Across crown (ear to ear)	<i>b</i>	minimum 50% of <i>a</i>	minimum 50% of <i>a</i>	minimum 50% of <i>a</i>	minimum 50% of <i>a</i>
Across crown (forehead to back)	<i>c</i>	minimum 50% of <i>a</i>	minimum 50% of <i>a</i>	minimum 50% of <i>a</i>	minimum 60% of <i>a</i>
Peak depth (forehead to centre edge)	<i>d</i>	minimum 5.0 cm	minimum 5.5 cm	minimum 6.0 cm	minimum 7.0 cm
Peak width (ear to ear)	<i>e</i>	minimum 35% of <i>a</i>	minimum 35% of <i>a</i>	minimum 35% of <i>a</i>	minimum 40% of <i>a</i>
Neck cover fabric (length)	<i>f</i>	minimum 8.0 cm	minimum 10.0 cm	minimum 12.0 cm	minimum 14.0 cm
Neck cover fabric width (ear to ear)	<i>g</i>	minimum 65% of <i>a</i>	minimum 65% of <i>a</i>	minimum 65% of <i>a</i>	minimum 60% of <i>a</i>

Figure 2 Simple full brim style hat

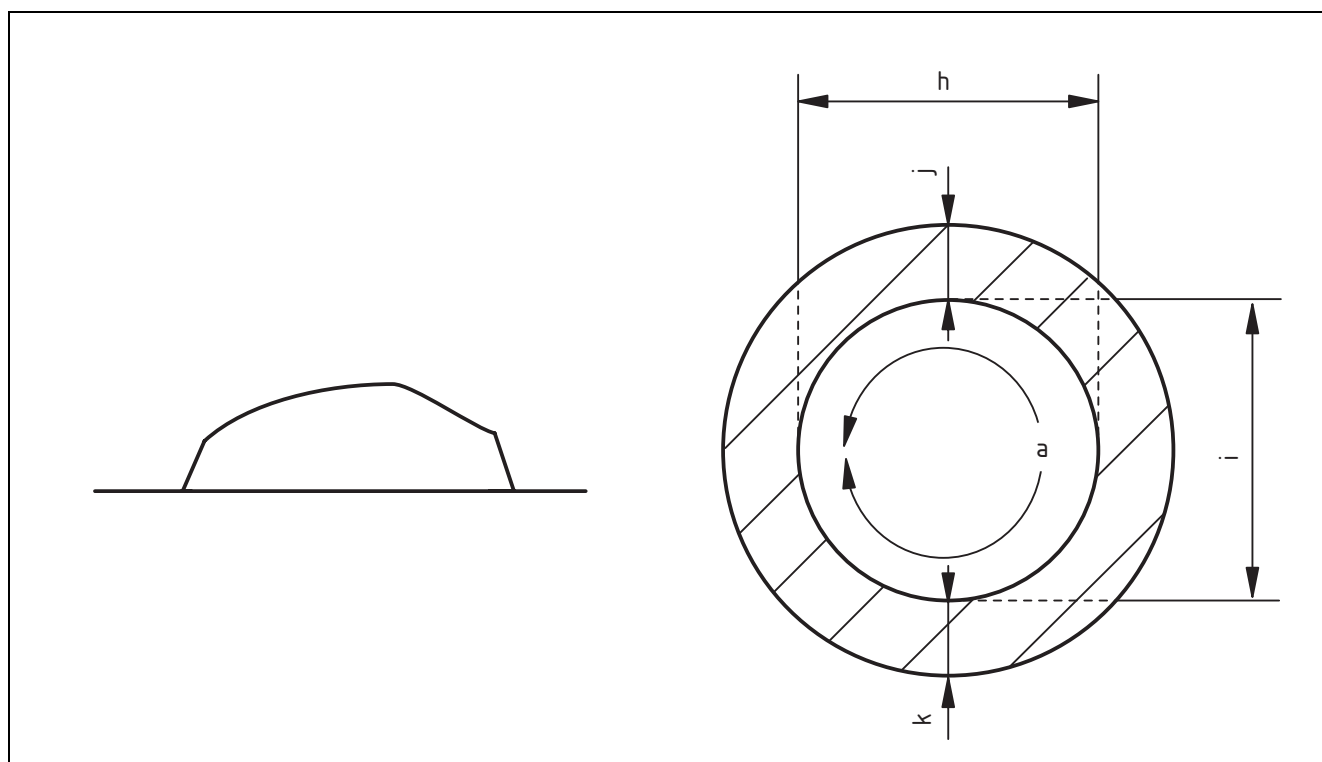


Table 2 Simple full brim style hat

Measurement		Infant 6 to 36 months	Child 3 to 7 years	Child 7 to 14 years	Adult
Circumference of hat	a	a	a	a	a
Across crown (ear to ear)	h	minimum 50% of a	minimum 50% of a	minimum 50% of a	minimum 50% of a
Across crown (forehead to back)	i	minimum 50% of a	minimum 50% of a	minimum 50% of a	minimum 60% of a
Brim depth	j, k	minimum 5.0 cm	minimum 5.5 cm	minimum 6.0 cm	minimum 7.0 cm

6 Test report

The test report shall contain the following:

- a) a reference to this standard, i.e. BS 8466:2006;
- b) a complete definition of the product tested, including type, colour, source and manufacturer's reference;
- c) method of sampling and by which organization;
- d) conditioning time and any deviation from the standard conditions of BS EN ISO 139;
- e) number and description of samples tested;
- f) minimum UPF for each area and colour of the item;
- g) the solar spectrum used (Albuquerque);
- h) any deviation from this standard.

7 Labelling

7.1 Permanent label

The item shall be marked with a permanent label listing the following:

- a) size or age range;
- b) the words "This hat conforms to BS 8466."

Fibre composition, care instructions, etc. may be on the same or a different label.

7.2 Non-permanent label/packaging for hats for adults and children over six months

The following wording shall appear on a non-permanent label or packaging.

This hat will provide protection against solar ultraviolet radiation and conforms to BS 8466.

WARNING

Sun exposure causes skin damage.

The hat will only provide protection to areas directly covered by the hat and, to a lesser extent, areas shaded from the sun.

Shaded areas of the face and neck and other exposed areas of the body should be protected by a high factor sun cream.

7.3 Non-permanent label/packaging for hats for babies over six months

The following wording shall appear on a non-permanent label or packaging.

This hat will provide protection against solar ultraviolet radiation and conforms to BS 8466.

WARNING

Sun exposure causes skin damage.

The hat will only provide protection to areas directly covered by the hat and, to a lesser extent, areas shaded from the sun.

Protect babies – they are particularly vulnerable. Sunburn during childhood can lead to skin cancer later in life.

Keep babies out of the sun.

Annex A (normative) Test method

A.1 Principle

The UPF is determined from the total spectral transmittance as described in BS EN 13758-1:2002, Clause 4.

A.2 Apparatus

A.2.1 Spectrophotometer, as specified in BS EN 13758-1:2002, 5.1 to 5.5.

A.3 Conditioning

Before testing, condition the fabric or hat for a minimum of 24 h in a standard atmosphere of $(20 \pm 2)^{\circ}\text{C}$ and $(65 \pm 2)\%$ r.h. as specified in BS EN ISO 139. If the spectrophotometer is not located in the conditioning area, complete the testing within 10 min of removing the sample.

A.4 Preparation

Prepare specimens in accordance with BS EN 13758-1:2002, 6.1.

Prepare the specimen areas to be tested so that they can be placed across the entrance port of the integrating sphere in a flat tensionless state without distortion. If necessary, cut the specimens from the hat ensuring that, in multilayer construction, the sample is presented to the apparatus in the same order as the made up hat.

A.5 Measurement of UV transmission

Calibrate the spectrophotometer as specified by the manufacturer.

Place the specimen over the transmission port with the UV transmitting filter between the specimen and the port and the inside (as worn) of the sample towards the inside of the integrating sphere.

Measure and record the transmission between 290 nm and 400 nm at intervals 5 nm or less. Turn the sample through 90° and repeat the measurement. Test the remaining three specimens in the same way.

A.6 Calculation and expression of results

Calculations and expression of results shall be as specified in BS EN 13758-1:2002, 8.1 and 8.2.

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