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Specification for

Visors for vehicle users

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Committees responsible for this British Standard

The preparation of this British Standard was entrusted by Technical Committee PH/2, Eye protection, to Subcommittee PH/2/5, Eye protectors for vehicle users, upon which the following bodies were represented:

- Auto-cycle Union
- British Medical Association
- British Motorcyclists' Federation
- British Safety Industry Federation
- BSIF Test & Certification Association
- BSI Testing Services
- Consumer Policy Committee of BSI
- Department of the Environment, Transport and the Regions — Central Transport Group
- Glass and Glazing Federation
- Institution of Mechanical Engineers
- Metropolitan Police
- Motor Cycle Industry Association Ltd.
- Personal Safety Manufacturers' Association
- Royal Automobile Club

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Foreword

This British Standard has been prepared by subcommittee PH/2/5, Eye protectors for vehicle users.

This revision of BS 4110:1979 *Specification for eye protectors for vehicle users*, removes requirements for goggles, which are contained in BS EN 1938 *Personal eye protection — Specification for goggles for motorcycle and moped users*.

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 12, an inside back cover and a back cover.

1 Scope

This standard specifies the design and performance requirements for visors for vehicle users and describes appropriate test methods.

It covers visors for attachment to helmets conforming to BS 6658:1995 or replacement visors for attachment to helmets conforming to either BS 2495 or BS 5361 which are now withdrawn.

It does not cover goggles for use by motorcycle or moped riders, which are covered by BS EN 1938.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this British Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. For undated references, the latest edition of the publication referred to applies.

BS 6658:1985, *Specification for protective helmets for vehicle users*.

BS EN 165:1996, *Personal eye-protection — Vocabulary*.

BS EN 166:1996, *Personal eye-protection — Specifications*.

BS EN 167:1995, *Personal eye-protection — Optical test methods*.

BS EN 168:1995, *Personal eye-protection — Non-optical test methods*.

ISO/CIE 10526:1991, *CIE standard colorimetric illuminants*.

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

BS EN 1836:1997, *Personal eye protection — Sunglasses and sunglare filters for general use*.

BS 2495 (withdrawn)¹⁾, *Protective helmets for vehicle users (high protection)*.

BS 5361 (withdrawn)¹⁾, *Protective helmets for vehicle users*.

3 Terms and definitions

For the purpose of this British Standard, the definitions given in BS EN 165:1995 and BS EN 1836:1997 and the following apply.

3.1

visor

eye protector having a protective transparent screen extending over the eyes and all, or part of the face, attached to a protective helmet in such a way that it can be removed and refitted for cleaning and replacement purposes

3.2

lens

that part of an eye protector through which the wearer sees an object

NOTE The term is not used in the optical sense.

3.3

disposable protective film

removable plastic film used to protect the lens prior to use

3.4

ocular areas

two circles of minimum diameter 52 mm, spaced symmetrically about the vertical centre line of the eye protector, with a distance of 64 mm between the centres of the circles when measured in the horizontal front plane of the visor, as worn

4 Design and manufacture

4.1 General

Visors shall be free from projections, sharp edges or other defects which are likely either to cause discomfort or injury during use, or to increase the risk of injury in the event of an accident.

4.2 Materials

No part of the visor which is in contact with the wearer shall be made of any materials that are known to cause irritation, allergic or toxic reactions amongst a significant proportion of users in a normal state of health.

4.3 Ventilation

Where provided, ventilation features shall be outside the ocular areas (see 3.4), and shall not reduce peripheral awareness significantly. They shall not allow direct entry of any airborne particles to the eye.

4.4 Helmet and visor compatibility

4.4.1 When designed to fit helmets conforming to BS 2495²⁾ or BS 5361²⁾ and in the closed position, a visor shall conform to the general shape of the helmet and shall project from it to the least practicable extent. Where a visor is integral with a helmet and can be removed only with the use of a tool, no part of the visor's attachment to the helmet shall project outwards by more than 5 mm from the visor whilst in the closed position.

4.4.2 When fitted to a helmet conforming to BS 6658:1985 and in the closed position, the combined helmet and visor shall conform to BS 6658:1985, 6.4.1.

4.4.3 If it is not possible to remove a visor from the line of sight in an emergency instantly, using one hand only, and without the need to undo fasteners, the labelling shall bear an appropriate warning. [See 7.2j).]

¹⁾ Can be obtained from the Information Centre, British Standards House, 389 Chiswick High Rd, London W4 4AL.

²⁾ Now withdrawn and superseded by BS 6658:1985.

5 Requirements

5.1 Field of vision

5.1.1 *Visors designed to be fitted to helmets conforming to BS 2495 or BS 5361*

When in the closed position, visors designed to fit helmets conforming to BS 2495 or BS 5361 shall not reduce the peripheral vision afforded by the helmet. Visors attached to, or integral with the helmet peaks shall conform to the peripheral vision requirements of BS 2495 or BS 5361 with the exception that the angle above the basic plane is reduced from 30° to 15°. In all modes of operation, visor markings shall not be visible in the field of vision offered by the helmet.

5.1.2 *Visors designed to be fitted to helmets conforming to BS 6658*

When in the closed position, visors designed to fit helmets conforming to BS 6658:1985 shall not reduce the peripheral vision afforded by the helmet.

When in any designed open mode, functional features shall only be provided where their total area does not exceed 250 mm² on either side of the vertical centre-line of the visor. These features shall not be situated in the defined ocular areas in any of the designed modes of operation of the visor. In all modes of operation, visor markings shall not be visible in the field of vision offered by the helmet.

Ventilation features that are provided on the lens of the visor shall be formed from the visor material itself. They shall be an integral part of the visor, and shall not be painted or covered by any other means. They shall not be situated in the defined ocular areas in any of the designed modes of operation of the visor. The total area of such features shall not exceed 500 mm² on either side of the vertical centre-line of the visor, and their design shall be such that the wearer is still protected in these regions from impacts and/or airborne particles.

Lifting elements shall be formed from the visor material itself and shall be an integral part thereof. Where a lifting element which overlaps the vertical centre-line of the visor is provided, it shall not encroach more than 5 mm from the visor edge and shall have a peripheral length not exceeding 10 mm each side of the vertical centre-line of the visor.

Where a lifting element or lifting elements are provided at the side or sides of the visor, they shall not encroach more than 5 mm from the visor edge and shall have a peripheral length not exceeding 25 mm. Such lifting elements shall not be situated in the defined ocular areas in any of the designed modes of operation of the visor.

Visors attached to, or integral with, a helmet peak shall conform to the field of vision requirements in BS 6658:1985, except that the region defined in BS 6658:1985, 5.5a) shall be taken as “a forward plane horizontally projected, which intersects the headform along the L1–L2 line”, i.e. 7° according to BS 6658:1985 5.5a) becomes 0°.

5.2 Optical properties

The optical properties shall be assessed on visors as offered for sale. When tested in accordance with 6.1 to 6.6, ocular areas shall conform to Tables 1 and 2. Visors shall be classified by filter category in accordance with Table 2. There shall be an overlap of transmittance values of not more than $\pm 2\%$ (absolute) between categories 0 and 1.

5.3 Impact strength

5.3.1 *Impact resistance*

Visors shall be tested in accordance with 6.7.

5.3.2 *Increased impact resistance*

If visors are described as offering increased impact resistance they shall be tested in accordance with 6.8.

5.4 Resistance to fogging

If lenses are described as resistant to fogging they shall remain free from fogging for a minimum of 8 s when tested in accordance with 6.9 and shall be considered resistant to fogging if the square of the transmittance has not fallen below 80 % of the initial value.

5.5 Resistance to abrasion

Following UV conditioning in accordance with 6.6.1 samples representing the visor material shall be tested in accordance with 6.10. When tested in accordance with this method, samples shall show a light scatter value of not greater than 10 % on either surface.

NOTE See Figure 1 for the sequence of testing.

5.6 Resistance to corrosion

When visors are tested in accordance with 6.11 all surfaces shall remain smooth and free from oxidization.