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BRITISH STANDARD 2495 : 1960

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SPECIFICATION FOR

PROTECTIVE HELMETS AND PEAKS FOR RACING CAR DRIVERS

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THIS BRITISH STANDARD, having been approved by the Personal Safety Equipment Standards Committee, was published under the authority of the General Council on 20th April, 1960.

First published July, 1954.
First revision April, 1960.

The Institution desires to call attention to the fact that this British Standard does not purport to include all the necessary provisions of a contract.

In order to keep abreast of progress in the industries concerned, British Standards are subject to periodical review. Suggestions for improvements will be recorded and in due course brought to the notice of the committees charged with the revision of the standards to which they refer.

A complete list of British Standards, numbering over 3000, indexed and cross-indexed for reference, together with an abstract of each standard, will be found in the Institution's Yearbook, price 15s.

This standard makes reference to the following British Standards:

B.S. 1869 Protective helmets for racing motor cyclists.
B.S. 2001 Protective helmets for motor cyclists.
B.S. 2963 Test for flammability of fabric.
B.S. 3121 Performance requirements for materials described as of low flammability.

British Standards are revised, when necessary, by the issue either of amendment slips or of revised editions. It is important that users of British Standards should ascertain that they are in possession of the latest amendments or editions.

The following B.S.I. references relate to the work on this standard:
Committee reference PSM/10. Draft for comment CZ(PSM)347

CO-OPERATING ORGANIZATIONS

The Personal Safety Equipment Standards Committee, under whose supervision this British Standard was prepared, consists of representatives from the following Government department and scientific and industrial organizations:

British Chemical Plant Manufacturers' Association
British Iron and Steel Federation
British Ironfounders' Association
British Leather Manufacturers' Research Association
British Red Cross Society
Cotton Board
Electricity Council, the Generating Board and the Area Boards in England and Wales
Federation of British Rubber and Allied Manufacturers
Federation of Civil Engineering Contractors
Glass Manufacturers' Federation
Imperial Chemical Industries Ltd.
Industrial Safety (Personal Equipment) Manufacturers' Association
Industrial Welfare Society
Institute of British Foundrymen
Institute of Welding
Institution of Civil Engineers
Institution of Engineering Inspection
Institution of Mechanical Engineers
Institution of Production Engineers
Institution of Structural Engineers
Iron and Steel Trades Confederation
Medical Research Council
Ministry of Labour (Factory Inspectorate)
National Federation of Building Trades Employers
National Paint Federation
Royal Society for the Prevention of Accidents
Shipbuilding Employers' Federation
Trades Union Congress

The following Government departments and scientific and industrial organizations were directly represented on the Committee entrusted with the preparation of this British Standard:

Aluminium Development Association
Auto Cycle Union
Automobile Association
British Cellular Rubber and Plastics Manufacturers' Association
British Medical Association
British Plastics Federation
British Racing Drivers Club
D.S.I.R.—Road Research Laboratory
Ellis Research and Testing Laboratories
Federation of British Rubber and Allied Manufacturers
Joint Fire Research Organization of the D.S.I.R. and Fire Offices Committee
Ministry of Aviation
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Ministry of Transport
Protective Headwear Manufacturers' Association
Royal Automobile Club
War Office
Individual companies

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BRITISH STANDARD SPECIFICATION FOR

PROTECTIVE HELMETS AND PEAKS FOR RACING CAR DRIVERS

FOREWORD

This British Standard was first prepared by the Personal Safety Equipment Standards Committee at the suggestion of the motoring organizations, and the first edition was published in 1954. It has now been revised to take account of developments since that date. The standard specifies the requirements for protective helmets and peaks for use in high-speed motor car races. It is divided into five parts and now includes a new requirement for protection of the temples, together with a shock absorption test based on a new impact loading of 150 ft lb, a comparative test of protective padding materials, and a new test for attachment of peaks. This latter has led to an alteration in the title of the standard, which title is now in accord with its companion standards B.S. 1869* and B.S. 2001†.

This revision applies knowledge obtained from experience and from research carried out since the standard was first issued. A detailed study of the mechanics of head protection, and research into the effects of accidents, have been carried out at the Road Research Laboratory of the Department of Scientific and Industrial Research. It appears from these studies that the application to the head itself, whether protected or not, of a force in excess of 5000 lb (2270 kg), even for only a few milli-seconds, is likely to result in fatal concussion, and this forms the basis of the shock absorption test.

It is emphasized that the protection given cannot be complete and that the wearing of the helmet may not entirely prevent head injury or even death in severe accidents. The attention of users should be drawn to the fact that helmets are, of necessity, so constructed that the energy of a severe blow is absorbed in the partial destruction of the shell and/or protective padding material and, although damage may not be visible to the eye, any helmet which suffers such an impact should therefore be discarded and replaced by a new one.

The basic requirements for protection are that the helmet will have a strong outer shell and a means of energy absorption such as a layer of protective padding material between the shell and the wearer's head. The external surface of the helmet should be smooth and free from rigid external projections which, in a crash, might cause dangerously violent movements of the wearer's head. The helmet should be made of materials which are not adversely affected by exposure to the weather.

* B.S. 1869, 'Protective helmets for racing motor cyclists'.
† B.S. 2001, 'Protective helmets for motor cyclists'.

Maximum protection is obtained only when the helmet is a good fit and the chin strap is securely fastened.

NOTE. Where metric equivalents are stated, the figures in British units are to be regarded as the standard. The metric conversions are approximate. More accurate co. versions should be based on the tables in B.S. 350, 'Conversion factors and tables'.

SPECIFICATION

SECTION ONE: GENERAL

SCOPE

1. This standard deals with helmets for use in high-speed motor car races. Requirements are also specified for detachable peaks designed for use with these helmets.

NOTE. B.S. 2001* deals with helmets for everyday use for motor cyclists on the roads and B.S. 1869† deals with helmets for high-speed motor-cycle races. Helmets to this standard are also suitable for motor cyclists on the roads, though they do not comply fully with all the present national regulations for motor cycle racing in force in this country.

DEFINITIONS

2. For the purpose of this British Standard the following definitions apply:

a. Shell. The layer of hard smooth material which gives the helmet its general form and whose chief purpose is to protect the vault of the skull against fracture or penetration. It does not include the coverings or internal paddings.

b. Harness. The means of fitting the helmet to the head and securing it thereto. Its component parts are usually a cradle, a chin strap and a neck curtain.

c. Cradle. The head band or other head fitting and those internal parts of the helmet in contact with the head. The cradle may be fixed or adjustable

d. Chin strap. That part of the harness which passes under the chin.

e. Neck curtain. That part of the harness consisting of an additional band of material passing round the nape of the neck. It may be integral with the chin strap.

f. Protective padding material. Material whose principal object is to absorb the kinetic energy of the head during an impact. It may be of single thickness or laminated.

g. Cushioning material. Soft material used to ensure a comfortable fit of the helmet on the head.

WEIGHT

(See Amdt. 2)

3. ~~Each helmet shall be marked with figures showing helmet weight, which~~ weight shall ~~be the~~ greatest weight of one of six similar helmets of the same ~~size without peak and as offered for sale.~~

* B.S. 2001, 'Protective helmets ~~for motor cyclists~~'.
† B.S. 1869, ~~'Protective~~ helmets for racing motor cyclists'.

See Amdt. No. 4

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MATERIALS

4. *a. Effects of climate.* None of the essential properties of the materials used shall be adversely affected by exposure to moisture or to specified temperatures when submitted to the conditions described in Clause 17.

b. Shell. The shell of the helmet shall be made of materials which are hard, non-brittle and durable.

c. Harness. The harness shall consist of sweat-resistant material. Attention is drawn to the necessity of protecting certain materials which may be used for this purpose against the effects of oil or grease from the wearer's hair.

The manufacturer shall ensure that the materials used for the harness are not of a kind known to cause skin diseases. In the case of a material not in general use for harnesses, advice as to its suitability should be sought from a competent authority. See Amdt. 1

d. Flammability of materials. (i) The materials of the shell and the peak shall not burn quickly.

(ii) The outside material of the chin strap and neck curtain shall comply with the requirements specified in B.S. 3121, 'Performance requirements for materials described as of low flammability'.

(iii) Any surface of the chin strap and neck curtain which may make contact with the skin of the wearer shall be tested in the manner specified in B.S. 2963, 'Test for flammability of fabric', and shall not melt.

FINISH

5. All edges shall be smooth and rounded.

If any metallic parts appear on the inside of the shell, they shall be covered by protective padding material and shall be of such a form that they can not injure the wearer's head in the event of a crash.

Any external projections permitted by Clause 6 shall be smooth. When required to be faired to other surfaces, the angle to the surface shall be not greater than 15° at the point of entry.

SECTION TWO: CONSTRUCTION REQUIREMENTS OF HELMETS

GENERAL

6. The helmet shall consist of a hard, smooth shell lined with protective padding and/or fitted with other means of energy absorption such as a cradle. It shall be strongly attached to a chin strap and a neck curtain.

The assembled helmet shall have a smooth external surface without reinforcing ridges. There shall be no external projections greater than ⅛ in (3 mm) above the outer surface of the shell of the helmet except a peak fitting and, if required, a goggle clip.

The peak fitting shall project not more than ¼ in (6 mm) above the surface of the helmet and shall be at the lower front of the helmet. It shall

and a goggle clip or attachments for a visor, if either is required

be continuous and shall extend not more than 5 in (127 mm) round either side from the front centre of the helmet. The ends and the edges of the fitting shall be faired into the outer surface of the helmet.

The goggle fitting shall project not more than 3/16 in (5 mm) above the outer surface of the helmet and shall be at the back of the helmet. It may be unfastened if necessary to satisfy this requirement.

See Amdt. 3

Any external covering shall be seamless. The stitches securing the harness to the shell shall be covered by protective tape.

Rubber grommets may be fitted to ventilation holes.

Bare rivet heads shall project not more than 1/16 in (1·6 mm) above the outer surface of the helmet and shall show no sharp edges. They may be covered by a tape or band.

SHELL

7. The shell of the helmet shall be as nearly uniform in thickness and strength as is possible using normal manufacturing methods (such as drawing from sheet, spinning, laying up from layers of fibrous woven or knitted reinforcements) and shall not be specially reinforced at the test points.

If the shell is pierced for any purpose other than for the attachment of the harness or its parts, the number and size of the apertures shall be such that their total area does not exceed 0·25 sq in (1·61 cm²) on either side of the transverse centreline of the helmet.

The shell shall extend downwards at least as far as the line ACDEF on a headform, shown in Fig. 1. (See also Clause 11.) See Amdt. 1

CHIN STRAP

8. The chin strap shall be securely attached to the shell. If a chin cup is provided, it shall be detachable.

HEAD BAND OR OTHER HEAD FITTING

9. The head band or other head fitting shall not project below the lower edge of the shell at any point and shall be suspended or well cushioned from the shell.

When a head band is fitted, the lower edge shall be not more than ½ in (13 mm) above the base line of a headform and shall form the circumference AA shown in Fig. 1. See Amdt. 1

CRADLE

10. When the means of energy absorption includes a cradle, the width of tape for the cradle shall be not less than 1 in (25 mm) and the projected plan area of the tapes shall be not less than 30 per cent of the plan area of the appropriate size of headform on the base line.

EXTENT OF PROTECTION

11. For the purpose of defining the extent of protection, there shall be a circumference AA marked on a headform as shown in Fig. 1. A second circumference BB shall be not more than either 1¾ in (44 mm) above the base line of

See Amdt. 1

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