

Helmets for equestrian use

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Foreword

This Product Assessment Specification (PAS) has been prepared after consultation with manufacturers, users, medical and technical interests to provide a specification for helmets for equestrian use with levels of protection which exceed those in BS EN 1384:1997. It supersedes PAS 015:1994, which is withdrawn.

PAS 015 incorporates clauses from British and European and other national standards relevant to head protection. It is not a British Standard and will be withdrawn on publication of its content in or as a British Standard.

It is intended that the following aspects will be reviewed at a future date.

- a) Increase of impact drop height to 1.8 m for all impacts.
- b) UV ageing.
- c) Inclusion of rearward retention system effectiveness test.

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This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a Product Assessment Specification does not in itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 21 and a back cover.

Introduction

This Product Assessment Specification (PAS) specifies the requirements for protective headwear for use in equestrian activities.

Performance levels and test methods are based upon proven national and international methods of test and technical criteria and enhanced by data from expert sources in the field of head protection. Sources of test methods and technical criteria includes BS 4472 (now withdrawn), BS 6473 (now withdrawn), BS EN 443, BS EN 960, BS EN 1384, ASTM F1163 95 and AS 2063 for various type of protective headwear.

Specific areas that have been developed to give improved protection to the user are:

- a) shock absorption including the addition of hazard impacts and extension to the area of protection;
- b) penetration resistance;
- c) test area and extent of protection;
- d) retention system strength effectiveness;
- e) stability;
- f) lateral deformation.

A proportion of the energy of an impact is absorbed by the helmet, thereby reducing the force of the blow sustained by the head. The structure of the helmet may therefore be damaged in absorbing this energy and any helmet that sustains a severe blow should be replaced, even if damage is not apparent.

Wearers should be made aware that the protection given by a helmet depends on the circumstances of an accident, and wearing a helmet cannot always prevent death, injury or long-term disability.

1 Scope

This Product Assessment Specification (PAS) specifies the performance requirements and test methods for protective headwear for use in equestrian activities. It includes shock absorption, penetration resistance, strength and effectiveness of the retention system, durability of quick release mechanisms and deflection of the peak (where applicable).

2 Normative references

The following normative documents contain provisions, which, through reference in this text, constitute provisions of this part of this Product Assessment Specification. 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 EN 10109-1, *Rockwell test (scales A, B, C, D, E, F, G, H, K) and Rockwell superficial test (scales 15 N, 30 N, 45 N, 15 T, 30 T and 45 T)*.

BS EN 960:1995, *Headforms for use in the testing of protective helmets*.

ISO 6487:1987, *Road vehicles — Techniques of measurement in impact tests — Instrumentation*.

3 Terms and definitions

For the purposes of this Product Assessment Specification the following definitions apply.

3.1

helmet model

one of a range of helmets that differ essentially only in size

3.2

shell

materials that provide the normally hard outer form of the helmet including any edge trim, ventilator and/or other similar features, but excluding any peak

3.3

protective liner

material provided to absorb impact energy

3.4

comfort and size padding

padding material provided to ensure comfortable and correct fit

3.5

cradle

headband or other head fitting and those internal parts of the helmet other than the padding, which are in contact with the head

3.6

retention system

complete assembly by means of which the helmet is maintained in position on the head, including any devices for adjustment of the system or to enhance the wearer's comfort

3.7

chin strap

part of the retention system consisting of a strap of material that passes under the wearer's chin

3.8

quick release mechanism

a system attached to, or incorporated in, the helmet that allows the retention system to be fastened and unfastened quickly

3.9

area of protection

area above the line AP1F'P2A (see Figure A.1)

3.10

test line

test line DQ1F'P2A (see Figure A.1)

3.11

user adjustable draw lace

lace enabling the wearer to adjust the vertical position of the helmet on the head

3.12

fixed draw lace

non adjustable lace fitted by the manufacturer to position the helmet vertically on the head

3.13

peak

extension from the basic form of the helmet above the eyes

3.14

chin cup

cup mounted on the retention system to locate the strap on the point of the wearer's chin

4 Materials

The helmets shall be constructed from materials that are known not to deteriorate under the following conditions:

- ageing;
- exposure to sun;
- extremes of temperature;
- exposure to extremes of rain.

For those parts of the helmet coming into contact with the skin, materials known not to undergo alteration arising from the effects of sweat and toiletries shall be used. Materials known to cause skin allergies shall not be used.

5 Construction

5.1 General

The helmet shall comprise a shell with any necessary protective liner secured within it and shall be fitted with a retention system. The shell shall not extend beyond the protective liner. Where an open hook is used as a primary means of fastening the retention system, a secondary device shall be incorporated to prevent inadvertent release.

NOTE A replaceable sweatband may be fitted.

5.2 Finish

All edges shall be smooth and rounded. There shall be no rigid projections on the inside of the helmet. With the exception of ventilation buttons on top of the helmet and press studs for fixing a removable peak, any external projection shall not exceed 5 mm and shall be smoothly faired to the adjacent surface.

5.3 Retention system

With the exception of helmets designed for use by jockeys, a retention system shall be permanently fixed to the helmet.

NOTE Helmets designed for use by jockeys may be so designed that, either the portion that passes under the jaw, or the entire chin strap, is replaceable.

A retention system shall incorporate a chin strap not less than 15 mm in width. Fastening and adjustment devices shall be permanently fitted to adjust and maintain tension in the system. The fastening and adjustment devices shall have no sharp edges.

Fastening and adjustment systems may be combined. The chin strap shall not have a chin cup, but a chin cup may be fitted to a secondary strap if a separate primary strap is provided.

NOTE It is permissible for the system to include padding or other means of enhancing comfort to the wearer.

5.4 Area of protection

The extent of area of protection shall include all areas above the test line as defined in annex A.

5.5 Draw laces

The helmet shall not be fitted with user adjustable draw laces.

NOTE Fixed draw laces may be fitted.

6 Performance requirements

6.1 General

For all testing the helmet shall be positioned such that the lowest lateral mid point at the front of the liner is aligned equidistantly (midpoint) between the AA' plane and the reference plane, (see Figure A.1) or as low as the design will permit, (if this lies above midpoint.)

Sampling and sequence of tests shall be carried out in accordance with clause 7.

6.2 Shock absorption and hazard impact.

When tested in accordance with annex B the maximum deceleration shall not exceed 250 g and the total time during which it exceeds 150 g shall not be greater than 5 ms.

6.3 Penetration

When tested in accordance with annex C the point of the striker shall not leave a visible indentation on the test block.

6.4 Retention system strength

When tested in accordance with annex D the dynamic extension of the chin strap (including slippage of the buckle), as measured by displacement of the headform, shall not exceed 35 mm and the residual extension, with the weight at rest on the anvil, shall not exceed 25 mm.

Following the test, manual release of the unloaded buckle shall be possible.

6.5 Retention system effectiveness

When the helmet of a size appropriate to the headform used is tested in accordance with annex E the helmet shall not come off the headform.

6.6 Durability of quick-release mechanisms

Where the retention system incorporates a quick-release mechanism this shall still be capable of normal operation after being tested in accordance with annex F, and shall conform to 6.4.

6.7 Stability of helmet

When tested in accordance with annex G the vertical movement at the mid-point of the front edge of the liner shall not exceed 15 mm.

6.8 Lateral deformation

When tested in accordance with annex H, the maximum lateral deformation of the helmet shall not exceed 30 mm, and the residual lateral deformation shall not exceed 10 mm.

6.9 Peak deflection

Where a helmet has a peak it shall be tested in accordance with annex J and the deflection measured shall be greater than 6.0 mm.

6.10 Durability of marking

The label shall still be attached to each helmet and be legible after the helmet has been conditioned in accordance with annex K.

7 Sampling and test sequence

7.1 Sampling

Helmets shall be tested as offered for sale, (inclusive of any accessories, marking and labelling).

For each model a minimum of 16 samples including at least one sample for each consumer size shall be tested.

No helmet, which has been subjected to any test, shall be offered for sale or used under any circumstances.