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Čelade za konjeniške aktivnosti

Helmets for equestrian activities

Schutzhelme für reiterliche Aktivitäten

Casques de protection pour sports hippiques

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Helmets for equestrian activities

Casques de protection pour activités équestres

Schutzhelme für reiterliche Aktivitäten

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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European foreword

This document (EN 1384:2023) has been prepared by Technical Committee CEN/TC 158 “Head protection”, the secretariat of which is held by SIS.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by October 2023, and conflicting national standards shall be withdrawn at the latest by October 2023.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 1384:2017.

In comparison with the previous edition, the following technical modifications have been made:

- in Clause 2, EN ISO 13688:2013 has been added referenced in 4.3 Materials innocuousness;
- in Clause 4.1, clarifications have been added;
- new Clause 4.2 Ergonomics and Clause 5.1.6 Ergonomics assessment have been added;
- in Clause 4.6, a hazard anvil impact test has been added;
- in Clause 4.7, three impacts in test method described in 5.8 has been added;
- in Clause 4.9.2, reworded to “the maximum displacement of the headform”;
- from Clause 5 *Testing*, requirements were moved to 4.3 *Materials innocuousness* and a new Clause 5.13 *Test of materials innocuousness* have been added;
- in Clause 5.7.1, Figure 3 – *Definition Hazard Anvil* has been added;
- in Clause 5.7.3, speed for hazard anvil has been added;
- in Clause 5.7.4, rewritten clause and added impact sites for hazard anvil;
- in Clause 5.7.5, as a result of the additional impact the test period has been extended to 360 seconds;
- in Clause 5.8.4, increased impact energy changed to 18,4 J ± 0,5 J and theoretical drop height changed to 625 mm;
- in Clause 5.8.5, changed to “three” impact sites on each helmet;
- in Clause 5.9.3, force set changed to 800 N ± 20 N;
- in Clause 6.2 new requirements and clarification to text;
- Table ZA.1 has been updated with corresponding clauses to Regulation (EU) 2016/425.

This document has been prepared under a Standardization Request given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s) / Regulation(s).

EN 1384:2023 (E)

For relationship with EU Directive(s) / Regulation(s), see informative Annex ZA, which is an integral part of this document.

Any feedback and questions on this document should be directed to the users' national standards body. A complete listing of these bodies can be found on the CEN website.

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom.

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Introduction

This document specifies the requirements for protective headwear for use in equestrian activities that can result in a broad spectrum of accident situations.

Equestrian activities where helmets are used include a number of different disciplines such as rider, handler and/or carer, carried out indoors and outdoors and under varying climate conditions.

This document includes tests for shock absorption, penetration, lateral crush. There are different statistical accident studies from racing sports, competition, and leisure riding activities. The most common accident situation resulting in head injuries are fall accidents from the horse. There are also accidents where the rider is injured during handling where the horse interacts with the rider.

This document covers today linear impacts to the head in the shock absorption test. The reason for not implementing a rotational test method is that no test method is specified at the time of writing this document. CEN/TC 158/WG 11 will in the near future present a new test method, which can be used in future revisions of EN 1384.

Also, this document tests the helmets effectiveness for a horseshoe impact in the shock absorption against the hazard anvil and sharp objects in the penetration test. The mechanical strength is tested by measuring the lateral deformation. This test will only evaluate that the helmet has a minimum lateral deformation that will protect the skull from fracture. A helmet that passes the mechanical strength test will not per definition protect the wearer from a horse falling directly onto the helmet.

Wearers need to be made aware that the protection given by a helmet depends on the circumstances of the accident and wearing of a helmet cannot always prevent injury, death or disability.

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 can be damaged in absorbing this energy and any helmet that sustains a severe blow should be replaced even if damage is not apparent.

Performance levels and test methods are based upon proven methods of test and technical criteria and enhanced by data from expert sources in the field of head protection.

EN 1384:2023 (E)**1 Scope**

This document specifies requirements for protective helmets that can have a peak, for people involved in all equestrian activities including but not limited to riding, driving, or handling and caring for horses.

It gives safety requirements that include methods of test and levels. Requirements and the corresponding methods of test are given for the following:

- a) construction, including field of vision;
- b) shock absorbing properties;
- c) resistance to penetration;
- d) mechanical strength in lateral deformation;
- e) retention system properties;
- f) deflection of peak (if fitted);
- g) marking and information;
- h) use of headforms in accordance with EN 960:2006.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

EN 960:2006, *Headforms for use in the testing of protective helmets*

EN 1811:2023, *Reference test method for release of nickel from all post assemblies which are inserted into pierced parts of the human body and articles intended to come into direct and prolonged contact with the skin*

EN 13087-1:2000¹, *Protective helmets — Test methods — Part 1: Conditions and conditioning*

EN 13087-2:2012², *Protective helmets — Test methods — Part 2: Shock absorption*

EN 13087-3:2000³, *Protective helmets — Test methods — Part 3: Resistance to penetration*

EN 13087-4:2012, *Protective helmets — Test methods — Part 4: Retention system effectiveness*

EN 13087-5:2012, *Protective helmets — Test methods — Part 5: Retention system strength*

EN 13087-6:2012, *Protective helmets — Test methods — Part 6: Field of vision*

¹ As amended by EN 13087-1:2000/A1:2001.

² As amended by EN 13087-2:2000/A1:2001.

³ As amended by EN 13087-3:2000/A1:2001

EN ISO 7500-1:2018, *Metallic materials — Calibration and verification of static uniaxial testing machines — Part 1: Tension/compression testing machines — Calibration and verification of the force-measuring system (ISO 7500-1:2018)*

EN ISO 13688:2013⁴, *Protective clothing — General requirements (ISO 13688:2013)*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

3.1

shell

material that provides the hard outer case of the helmet

3.2

protective padding

padding material liner provided to absorb impact energy

3.3

comfort padding

padding solutions provided for sizing and comfortable fit

3.4

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

3.5

draw-lace

lace used by a wearer for making adjustments to the fit of the cradle on the head

3.6

chin strap

part of the *retention system* (3.4) consisting of a strap that passes under the wearer's jaw to keep the helmet in position

3.7

chin cup

cup mounted on the *retention system* (3.4) to locate the strap on the point of the wearer's chin

3.8

helmet type

category of helmets which do not differ in such essential respects as the material, construction of the helmet, *retention system* (3.4) or *protective padding* (3.2)

Note 1 to entry: Difference in sizes in itself does not constitute different helmet types.

⁴ As amended by EN ISO 13688:2013/A1:2021.

EN 1384:2023 (E)**3.9****peak**

extension from the basic form of the helmet above the eyes

Note 1 to entry: Depending upon the construction of the helmet, such extension may be considered to be, or not to be, a peak with respect to 5.12 Peak deflection. It may be integral with, or detachable by the wearer from the helmet.

3.10**area of protection**

minimum area of the headform covered by the *protective padding* (3.2)

3.11**test area**

area of helmet which is subject to shock absorption and penetration tests

3.12**retention fixing point**

part of the helmet to which the *retention system* (3.4) is permanently attached

4 Requirements**4.1 General**

Helmet marking shall not be removed during use. The durability of the markings shall be assessed according to 5.1.2.

Helmets for equestrian activities may be constructed either with or without a shell (3.1) and with or without means of ventilation. Any ventilation features shall be restricted to the area above the test line according to 5.1.5.

If a shell is used, then protective padding (3.2) shall be securely fastened to it.

If there are draw-laces (3.5) or other adjusting systems for fit and retention, the adjustment shall not become undone unintentionally and shall meet all of the requirements of this document.

4.2 Ergonomics

Helmets for equestrian activities shall be designed to minimize the discomfort of wearing them and shall remain in place when fitted and fastened according to manufacturer's instructions.

Solution(s) may be used for comfort and correct fit, for example comfort padding (3.3).

The ergonomics of the design is assessed according to 5.1.6.

4.3 Materials innocuousness

For those parts of the helmet which come, or can come, into contact with the skin, materials which are known to cause skin disorders or other adverse effects on health shall not be used. The material requirements can be verified by documents relevant to the materials used in the product by the manufacturer in accordance with 5.13.

The material used shall not be subject to any known appreciable alteration from contact with sweat or toiletries or cleaners recommended by the manufacturer.

All metallic materials which could come into prolonged contact with the skin (e.g. studs, fittings) shall have a release of Nickel of less than 0,5 µg/cm³ per week when tested according to EN 1811:2023.

Presence of plasticisers, unreacted components, heavy metals, impurities and the chemical identity of pigments and dyes shall be in accordance with EN ISO 13688:2013⁴, 4.2.

4.4 Finish and projections

The following requirements shall be assessed in accordance with 5.1.1 and 5.1.4.

There shall be no sharp edges, roughness or projection on any parts of the helmet which are in contact, or potential contact, with the wearer, when the helmet is worn, such as is likely to cause injury to the wearer.

Where external surface projections exceed 5 mm they shall be smoothly faired to the adjacent surface.

There shall be no rigid projections on the inside of the helmet exceeding 2 mm.

4.5 Extent of protection

The coverage shall extend down to and include both the area above the AA' plane and the area above the RF1R'F2 line, point R' is at the level of the reference plane (see Figure 2).

4.6 Shock absorption

When tested in accordance with 5.6 and 5.7, for each impact:

- the maximum acceleration shall not exceed 250 *g* for the flat anvil at any time;
- the maximum acceleration shall not exceed 200 *g* for the hazard anvil at any time;
- the total time during which the curve (acceleration / function of time) exceeds 150 *g* shall not be greater than 5 ms;
- the retention system shall remain fastened, and the helmet shall remain on the headform.

4.7 Penetration

When tested by the method described in 5.8, three impacts on the same helmet, there shall be no contact between the striker and test block.

4.8 Mechanical strength

When tested in accordance with 5.9 the maximum lateral deformation of the helmet shall not exceed 30 mm, and the residual lateral deformation shall not exceed 10 mm.

4.9 Retention system

4.9.1 General

The following requirements shall be visually and manually assessed in accordance with 5.1.3.

All parts of the retention system (3.4) shall be securely attached to the system or to the helmet, so it could not be removed or detached during its use and verified in 5.10 and 5.11.

The system can include padding or other means of enhancing comfort to the wearer.

The system shall be fitted with fastening and adjustment devices which may be combined.

The retention system shall be freed by deliberate action only.

A retention system shall incorporate a chin strap (3.6) not less than 15 mm wide and shall be verified by measurement.

The chinstrap shall be adjustable in length.

The chin strap shall not have a chin cup (3.7).

The colour of any part of the retention system shall not be green.