BS EN 13484:2012

BSI Standards Publication

Helmets for users of luges

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National foreword

This British Standard is the UK implementation of EN 13484:2012. It supersedes BS EN 13484:2002, which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee PH/6/6, Protective helmets for sport and leisure.

A list of organizations represented on this committee can be obtained on request to its secretary.

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Helmets for users of luges

Casques pour utilisateurs de luges

Helme für Benutzer von Rodelschlitten

This European Standard was approved by CEN on 17 December 2011.

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Foreword

This document (EN 13484:2012) has been prepared by Technical Committee CEN/TC 158 “Head protection”, the secretariat of which is held by BSI.

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of an identical text or by endorsement, at the latest by August 2012, and conflicting national standards shall be withdrawn at the latest by August 2012.

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

This document supersedes EN 13484:2001.

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

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

Annex B provides details of significant technical changes between this European Standard and the previous edition.

According to the CEN/CENELEC Internal Regulations, the national standards organizations 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, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

The intention of helmets is to reduce the risk of injury to the skull and part of the head surrounded by the helmet.

The protection given by a helmet depends on the circumstances of the accident and wearing a helmet cannot always prevent death or long term disability.

In this European Standard, the concept of optimum level of protection has been taken into account. This means that the protection efficiency is as high as possible, without decreasing the wearer's acceptance to the extent that she/he will not wear it, because of discomfort caused by the increase of the mass and dimensions.

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.

To achieve the performance of which it is capable, and to ensure stability on the head, a helmet should be as closely fitting as possible consistent with comfort. In use it is essential that the helmet is securely fastened, with any chin strap under proper tension at all times.

1 Scope

This European Standard specifies the minimum performance requirements and test methods for helmets for users of luges in competition in ice channels.

Requirements and the corresponding methods of test, where appropriate, are given for the following:

— construction including field of vision;

— shock absorbing properties;

— resistance to penetration;

— retention system properties;

— marking and information.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. 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*

ISO 6487, *Road vehicles — Measurement techniques in impact tests — Instrumentation*

3 Terms and definitions

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

3.1
protective helmet
item to be worn on the head, intended to absorb the energy of an impact, thus reducing the risk of injury to the head

[based on EN 1077:2007]

3.2
shell
outer layer which provides part of the whole general form of the helmet

[based on EN 1077:2007]

3.3
helmet type
category of helmets which does not differ in such essential respects as the materials or dimensions or construction of the helmet, of the retention system, or of the protective padding

[based on EN 1077:2007]

Note 1 to entry Helmet type can include a range of helmet sizes, provided that the thickness of the protective padding in each size in the range is at least equal to that in the helmet which when subjected to the tests satisfies the requirements of this European Standard.

3.4
padding
[according to EN 1077:2007]

3.5
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

[based on EN 1077:2007]

3.6
chin-strap
part of the retention system consisting of a strap that passes under the wearer's jaw to keep the helmet in position

[based on EN 1077:2007]

3.7
basic plane of the human head
longitudinal plane which passes through the lower level of the eye orbits and the upper level of the external opening of the ear canals

[EN 960:2006, 2.10]

3.8
basic plane of a headform
plane relative to the headform that corresponds to the basic plane of the human head

[based on EN 1077:2007, definition equivalent to that in EN 960:2006, 2.10]

3.9
reference plane
construction plane parallel to the basic plane of the headform at a distance from it which is a function of the size of the headform

[based on EN 1077:2007, definition equivalent to that in EN 960:2006, 2.5]

3.10
luge
equipment guided by runners, without any inside or outside driving power, for using in ice channels and not in natural tracks or downhill gliding

4 Requirements

4.1 Materials

For those parts of the helmet coming into contact with the skin the material used shall be known not to undergo appreciable alteration from contact with sweat or with substances likely to be found in cosmetic products. Materials shall not be used which are known to cause skin disorders. Testing according to 5.1.

4.2 Construction

4.2.1 General

The helmet normally consists of means of absorbing impact energy and means of retaining the helmet on the head even in an accident.

The helmet shall be so designed and shaped that parts of it (visor, rivets, ventilators, edges, fastening device and the like) are not likely to injure the user in normal use.

NOTE Helmets should:

— have low weight;

— be easy to put on and take off;

— be usable with spectacles;

— not significantly interfere with the ability of the user to hear;

— have good durability and withstand normal handling;

— permit cleaning.

Testing shall be in accordance with 5.1.

4.2.2 Retention system

4.2.2.1 General

Means shall be provided for retaining the helmet on the wearer's head. All parts of the retention system shall be securely attached to the system or to the helmet.

NOTE 1 It is recommended that the opening mechanism be marked with red or orange colour.

NOTE 2 The colour of any part of the retention system should not be green, as green is used for helmets with an emergency release system.

Testing shall be in accordance with 5.1.

4.2.2.2 Chin straps

The chin strap shall not include a chin cup.

Any chin strap shall be no less than 15 mm wide.

Chin straps can be fitted with means of enhancing comfort for the wearer.

Testing shall be in accordance with 5.1.

4.2.2.3 Fastening devices

Any chin strap shall be fitted with a device to adjust and maintain tension in the strap.

Testing shall be in accordance with 5.1.

4.2.3 Field of vision

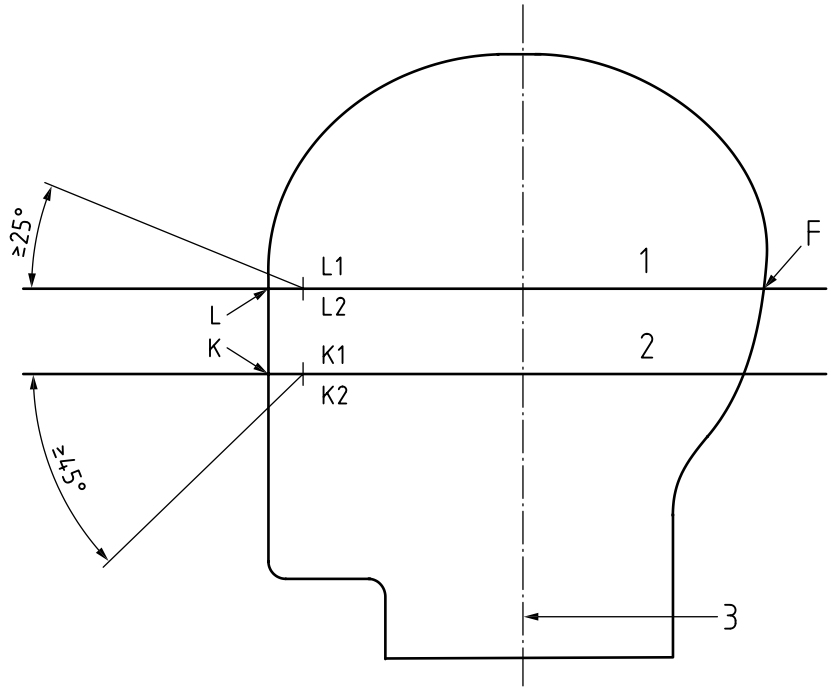
When tested in accordance with 5.5 there shall be no occultation in the field of vision bounded by angles as follows (see Figure 1):

— horizontally 105°

— upwards 25°

— downwards 45°

Dimensions in millimetres



Key

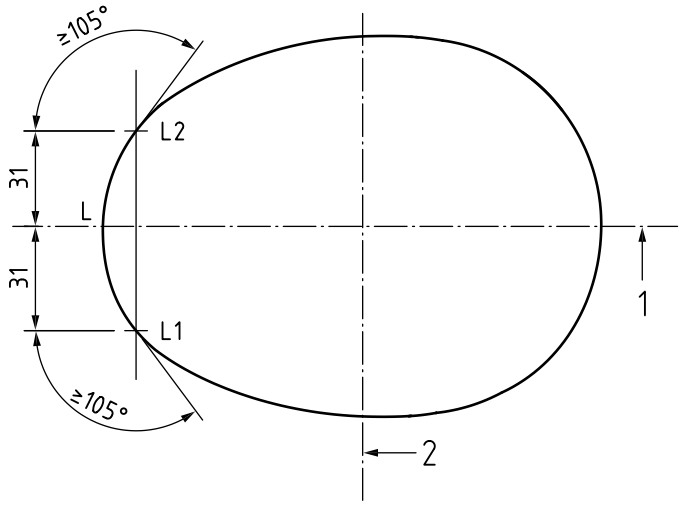
1 reference plane

2 basic plane

3 central vertical axis

a) Section of headform in vertical longitudinal plane

Dimensions in millimetres



Key

1 vertical longitudinal plane

(defined in EN 960:2006, 2.8 as mid-way between the headform's left- and right-hand extremities)

2 vertical transverse plane

(defined in EN 960:2006, 2.9 as mid-way between the headform's front and rear extremities)

b) Section of headform in reference plane

Figure 1 — Field of vision

4.3 Extent of coverage

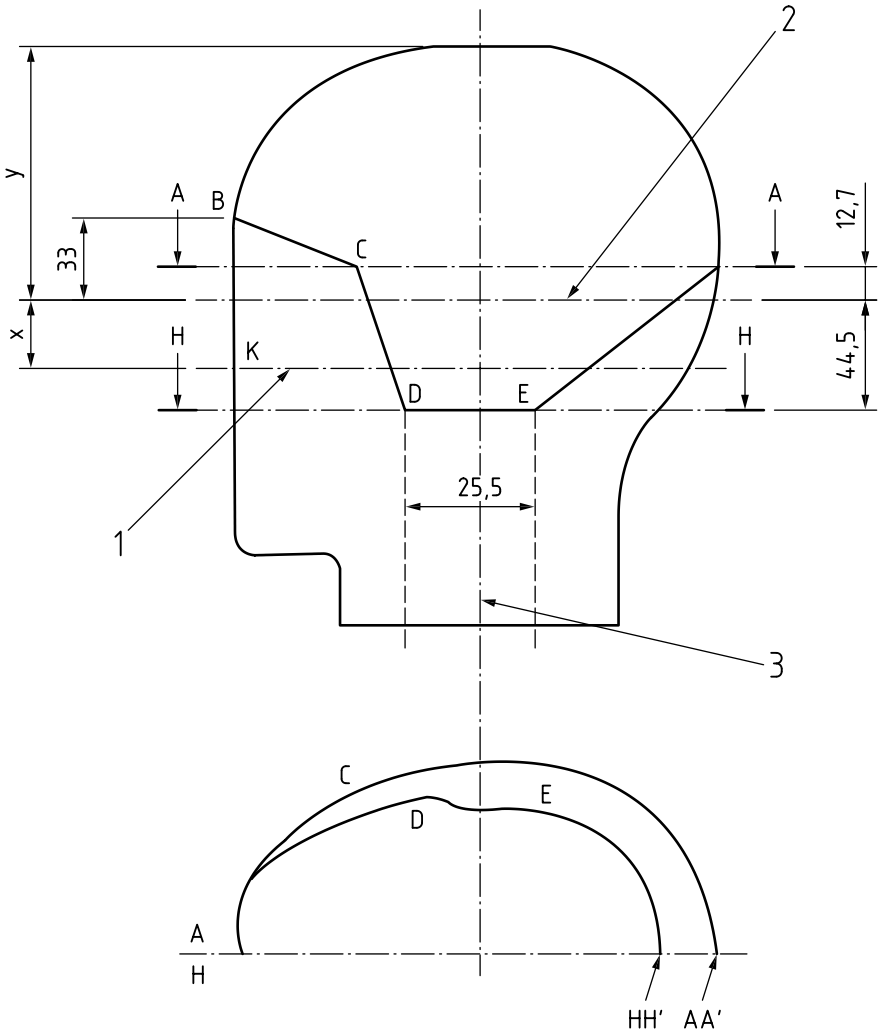
When tested in accordance with 5.5 the helmet shall cover at least the area above the line BCDEA' in Figure 2. Measurements for different headform sizes are given in Table 1.

NOTE Table 1 gives the EN 960:1994 equivalent letter codes to the EN 960:2006 size designations for headforms with similar nominal dimensions. These are as given in EN 960:2006, Annex C. The EN 960:2006 size designation approximates to the circumference of the headform at the reference plane, in mm.

Table 1 — Extent of coverage for different headform sizes

Size designation (EN 960:1994 equivalent)	**Stated headform circumference at the reference plane, mm**	**AC** **mm**	**HD** **mm**	***y*** **mm**	***x*** **mm**
495 (A)	495	84	89	89,7	23,5
535 (E)	535	88,5	92	96	25,5
575 (J)	575	93	95	102,4	27,5
605 (M)	605	97,5	98	107,2	29
625 (O)	625	100	100	110,2	30
NOTE The dimensions AC and HD correspond to the length of the chords measured with dividers.					

Dimensions in millimetres



Key

1 basic plane

2 reference plane

3 vertical transverse plane

Figure 2 — Minimum extent of coverage: Measurements for different headform sizes

4.4 Shock absorbing capacity

When tested in accordance with 5.7 the peak acceleration shall not, for any impact, exceed 250 g.

4.5 Resistance to penetration

When tested in accordance with 5.8 the point of the punch shall not touch the headform.

4.6 Retention system performance

4.6.1 Strength

When tested in accordance with 5.9, the dynamic extension shall not exceed 35 mm and the residual extension shall not exceed 25 mm. For this purpose, extension includes slippage of the fastening device. Following the test, the retention system shall still permit the helmet to be released from the headform by normal operation of the release system. Damage to the retention system shall be accepted provided that the above requirements are met.

NOTE In this test, slippage of the fastening device may be measured and recorded separately from other contributions to the extension, but this is for information only and is not subject to separate requirement.

4.6.2 Effectiveness

When tested in accordance with 5.10 the helmet, selected to be of appropriate size, shall not come off the headform.

4.7 Durability

After being tested the helmet shall not show damage that would cause an additional injury to the wearer (sharp edges, points, etc.). Report such damage in accordance with 5.7.3.2.

5 Testing

5.1 Visual inspection

Conformity of the requirements in 4.1, 4.2.1 and 4.2.2 shall be verified by the visual inspection of the samples, by measurement and by checking the information supplied by the manufacturer.

5.2 Headforms

The headforms used shall comply with EN 960:2006.

The sizes in Table 2 shall be used, except for the determination of shock absorbing capacity, for which only size designations 495, 535, 575, 605 and 625 shall be used.

NOTE Table 2 gives the EN 960:1994 equivalent letter codes to the EN 960:2006 size designations for headforms with similar nominal dimensions. These are as given in EN 960:2006, Annex C. The EN 960:2006 size designation approximates to the circumference of the headform at the reference plane, in mm.

Table 2 — Sizes of headforms

Size designation (circumference of headform at reference plane, mm)	**Code letter**
495	A
515	C
535	E
555	G
575	J
585	K
605	M
625	O

5.3 Sampling, number of samples and sequence of tests

Only new helmets with accessories as offered as for sale shall be tested.

For each helmet type, four helmets of the largest and four of the smallest headform size that fits within the manufacturer's claimed head size range shall be submitted for testing.

The sequence of tests performed on each helmet size,and the tests performed on the same sample, are given in Table 3.

Table 3 — Sequence of tests and number of tests per sample

Performance test	**Sequence of tests**	**Sample number**			
Retention system effectiveness (5.10)	1st	1	-	-	-
Shock absorbing capacity (5.7)	2nd	1	2	3	-
Retention system strength (5.9)	3rd	-	-	-	4
Resistance to penetration (5.8)	4th	-	-	-	4

5.4 Inspection and determination of mass

Inspect the helmet to ascertain whether it is suitable for its intended purpose and fulfils the general requirements in 4.2.1.

Determine the mass of the helmets of the same size submitted for testing. Calculate and record the mean value in grams rounded off to the nearest 10 g stating the size of the helmet.

5.5 Helmet positioning and determination of field of vision and area of coverage

Place the helmet on a headform of largest appropriate size and complying with the requirements for shape in EN 960:2006. Apply a load of 50 N on the crown of the helmet in order to adjust the helmet on the headform. Ascertain that the vertical median plane of the helmet coincides with the vertical median plane of the headform.

Adjust the helmet on the headform according to the manufacturer's instructions. In that position determine whether the helmet complies with the requirements for field of vision in 4.2.3 and the extent of coverage in 4.3.

To determine whether the helmet complies with the requirements for field of vision in 4.2.3, the test house shall select the size it considers likely to yield the least favourable result for the helmet type.

If any of the requirements in 4.2.3 and 4.3 are not fulfilled, adjust the helmet on the headform as little as possible to satisfy both requirements.

In that position draw the following line(s) on the helmet:

— a horizontal line at the level of the reference plane of the headform;

and on helmets that shall undergo the shock absorbing test:

— the impact zones as defined in 5.7.1.

5.6 Conditioning

5.6.1 Room conditioning

The sample shall be exposed to a temperature of + 20 °C ± 2 °C for 4 h to 24 h.

5.6.2 Low temperature conditioning

The sample shall be exposed to a temperature of - 25 °C ± 2 °C for no less than 4 h. Testing shall begin within 40 s after removal from the refrigeration chamber.

5.6.3 Artificial ageing

The sample shall be exposed successively to:

— a temperature of + 70 °C ± 2 °C for no less than 168 h;

— room conditioning according to 5.6.1;

— ultraviolet irradiation by a 125 W xenon-filled quarts lamp for 48 h at a range of 250 mm evenly over the exterior surface of the sample (e.g. by rotation);

— room conditioning according to 5.6.1.

NOTE A method for artificial ageing is described in Annex A. This method can be used as an alternative to the conditioning according to 5.6.3.

5.7 Determination of shock absorbing capacity

5.7.1 Impact zones

An area 20 mm in from the line BCD and down to the reference plane is divided into five zones: front, two sides, crown and rear. See Figure 3.

The measurements for different headform sizes are given in Figure 2.

The crown zone shall be that part of the headform and helmet above a horizontal plane through a point on the central vertical axis 10 mm below the top of the headform. The other four zones cover the rest of the test area as follows:

— the front zone is defined as that subtended by an angle of 60° placed symmetrically about the plane of symmetry of the headform and measured from the central vertical axis;

— the rear zone is defined as that subtended by an angle of 90° placed symmetrically about the plane of symmetry of the headform and measured from the central vertical axis;

— two side zones shall consist of the remaining two sections.

5.7.2 Apparatus

5.7.2.1 Description

The test apparatus shall comprise:

— an anvil rigidly fixed to a base;

— a free fall guidance system;

— a mobile system supporting the helmeted headform;

— a headform fitted with a tridirectional accelerometer and a measuring assembly;

— a system by which the point of impact can be brought into correspondence with the centre of the anvil.

The principle of the apparatus is shown in Figure 4.

5.7.2.2 Base

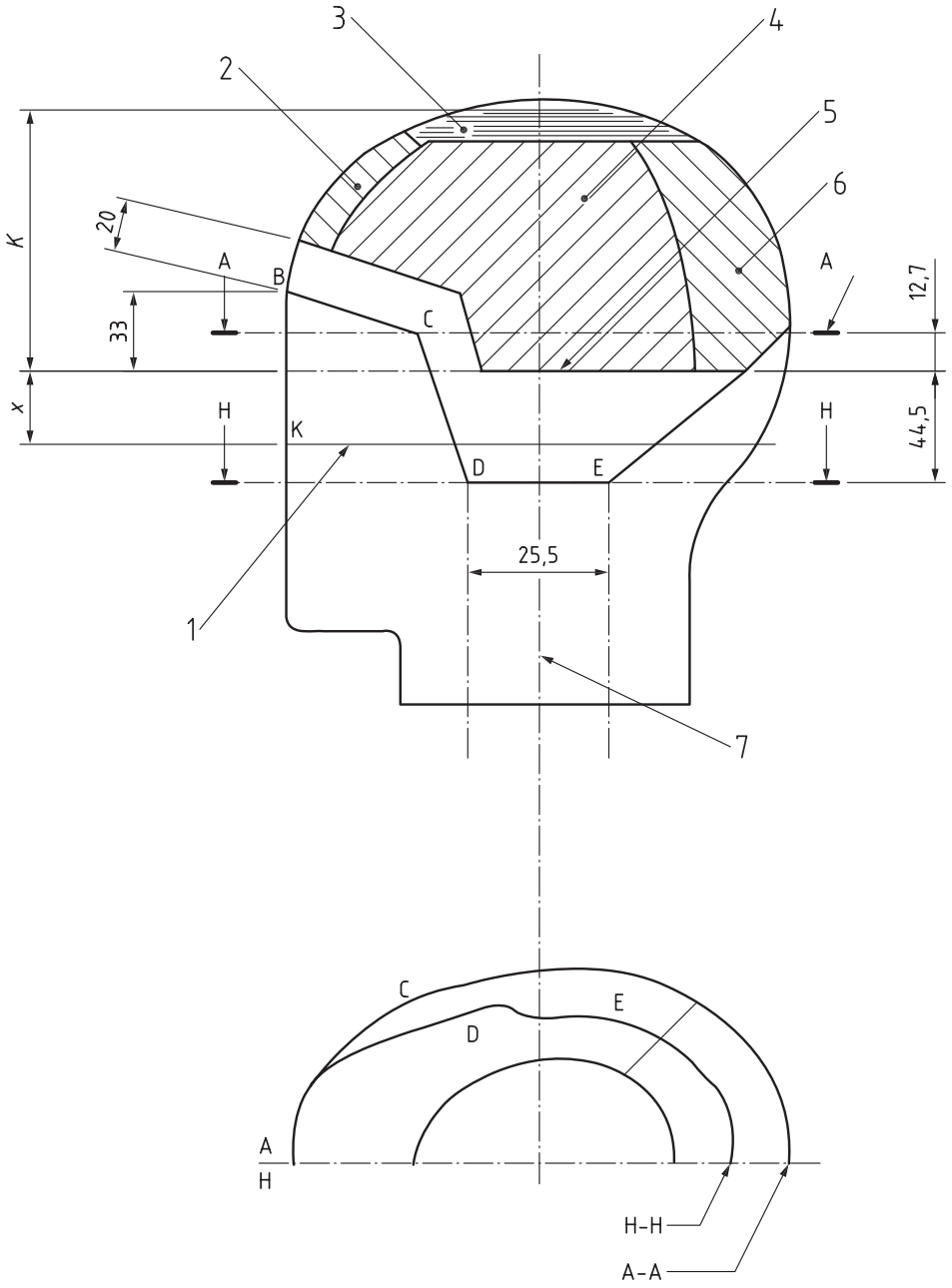
The base shall be monolithic and made of steel or a combination of steel and concrete and have a mass of no less than 500 kg. At least the uppermost 25 mm shall consist of steel and be firmly attached to the concrete.

No part of the base or anvil shall have a resonance frequency liable to affect the measurements.

5.7.2.3 Anvil

A flat steel anvil having a circular impact face of (130 ± 3) mm diameter.

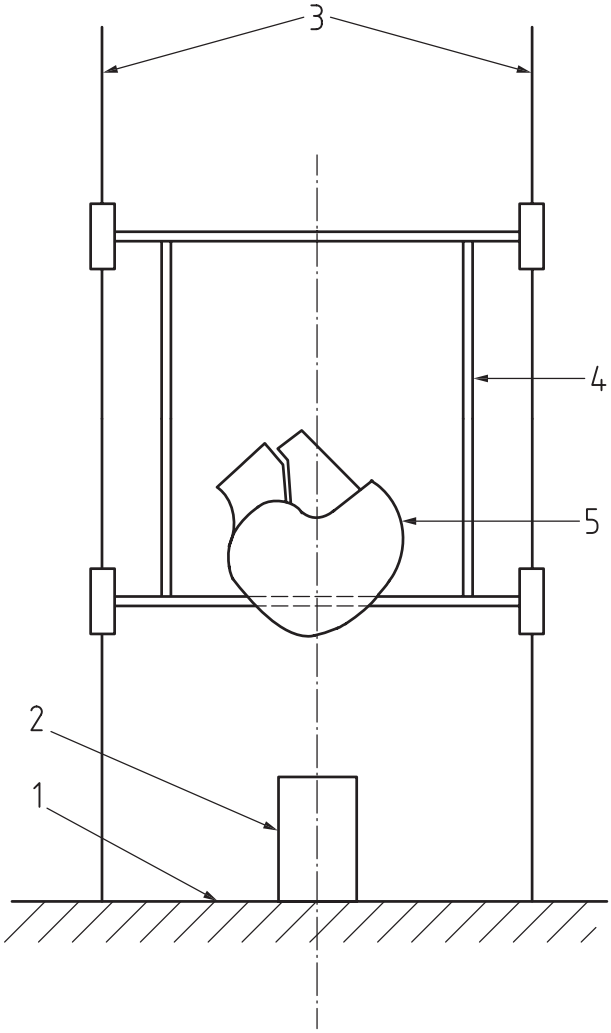
Dimensions in millimetres



Key

1 basic plane
2 front
3 crown
4 side
5 reference plane
6 rear
7 vertical transverse plane (defined in EN 960:2006, 2.9 as mid-way between the headform's front and rear extremities)

Figure 3 — Definition of impact zones



Key

1 steel base
2 anvil
3 guides
4 support dolly
5 headform with helmet

Figure 4 — Principle of apparatus for determination of shock absorbing capacity

5.7.2.4 Mobile system and guides

The mobile system supporting the headform shall be such that its characteristics do not affect the measurement of acceleration at the centre of gravity of the headform. It shall also be such that any point in the impact zones can be positioned vertically above the centre of the anvil.

The guides shall be such that the impact velocity is no less than 95 % of the theoretical velocity.

5.7.2.5 Accelerometer and measuring assembly

The tridirectional accelerometer is mounted at the centre of gravity of the headform. The transducer shall be capable of withstanding a maximum acceleration of 2 000 g without damage. The mass shall be a maximum of 50 g.

The measuring channel shall have a frequency response in accordance with channel frequency class (CFC) 1000 of ISO 6487.

The measuring system shall include equipment to record the velocity of the headform.

5.7.3 Procedure

5.7.3.1 Testing parameters

The testing shall be carried out according to Table 4.

Table 4 — Testing parameters

Sample	Conditioning
1	Ambient temperature
2	Low temperature
3	Artificial ageing

Position the helmet in accordance with 5.5.

The helmet shall be impacted in sites that shall be selected by the test house.

Each helmet of each size shall be impacted in two different zones with one impact per zone and all zones shall be impacted at least once.

The impact sites on the same sample shall be separated by a distance of minimum 150 mm measured as a chord with a divider.

The impacts shall be directed towards the centre of gravity of the headform.

The velocity of the headform shall be $5{,}42\,^{0}_{-0{,}1}$ m/s (this is theoretically equivalent to a drop height of 1 500 mm).

The velocity of the headform shall be measured at a distance between 60 mm and 10 mm prior to impact, to an accuracy of 1 %.

The testing shall be conducted under recorded conditions of ambiente temperature.

Applicable conditioning shall be made according to 5.6.

5.7.3.2 Recording

The measured results (g_{max}) shall be recorded in tabular form completed with time/acceleration diagrams.

The extent of any damage as described in 4.7 shall also be recorded.

5.8 Determination of resistance to penetration

5.8.1 Apparatus

5.8.1.1 Description

The test apparatus shall comprise:

— a metal punch held in position against the helmet;

— a metal drop hammer with a free fall guidance system;

— a device to indicate the distance between the point of the punch and the headform;

— a headform rigidly mounted.

5.8.1.2 Punch

The punch shall be conical at its lower end with a rounded point and have the following characteristics:

Mass	(300 ± 10) g
Angle of cone	(60 ± 1)°
Radius of point	(0,5 ± 0,1) mm
Hardness of tip	50 HRC to 45 HRC

5.8.1.3 Drop hammer

The mass of the drop hammer shall be (3 ± 0,025) kg.

5.8.1.4 Indicating device

The device to indicate the distance between the point of the punch and the headform shall be of low inertia, such as a photoelectric device.

5.8.1.5 Guidance system

The guidance system shall be such that the impact velocity is no less than 95 % of the theoretical velocity measured at a distance not exceeding 60 mm prior to impact.

5.8.1.6 Headform

The headform shall be rigidly mounted on a base as described in 5.7.2.2 in such a way that it can be orientated so that the plane tangential to the surface of the helmet at the point selected for the test is substantially horizontal.

5.8.2 Procedure

The helmets shall first undergo the process of conditioning which in the opinion of the test laboratory gave the least satisfactory results in the shock absorbing test.

Within 1 min of its removal from conditioning, mount the helmet, with an initial load of 50 N, on the headform in such a way that the plane tangential to the surface at the point selected for the test is substantially horizontal. Any means of adjustment, with the exception of the chin-strap, shall be completely slackened.

Allow the drop hammer to fall on the top of the punch. The velocity of the hammer shall be $3{,}84^{\,0}_{-0{,}1}$ m/s (this is theoretically equivalent to a drop height of 750 mm). The velocity shall be measured at a distance between 60 mm and 10 mm prior to impact, to an accuracy of 1 %.

Each helmet shall be impacted three times, each time in a different zone. (See 5.7.1). The sites to be chosen by the test laboratory but shall be at least 150 mm apart measured as chords with dividers.

NOTE The distance between the point of the punch and the headform after each impact.

5.9 Determination of retention system strength

5.9.1 Apparatus

5.9.1.1 Description

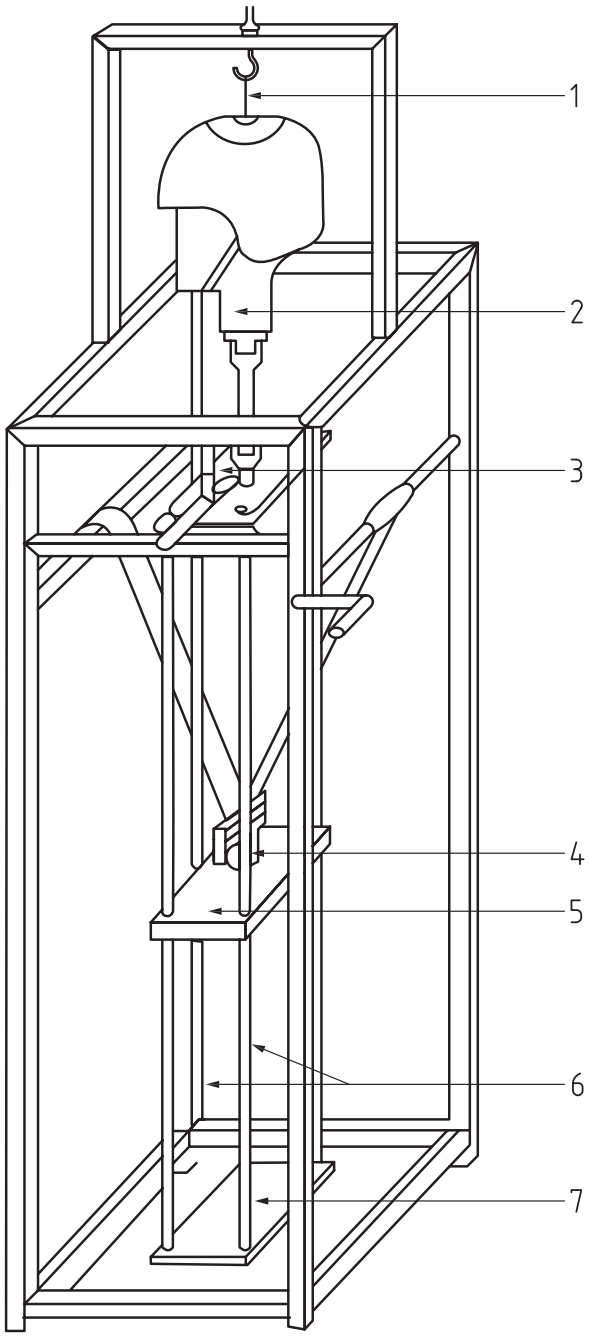
The test apparatus shall comprise:

— means to hold the helmet with headform and loads;

— a headform equipped with a loadbearing device comprising a guide and arrest device and a drop weight;

— a measuring device.

A suitable apparatus is shown in Figure 5.



Key

1 fixed helmet support
2 headform
3 displacement recorder
4 drop release
5 drop weight, mass 10 kg
6 guides
7 anvil

Figure 5 — Apparatus for testing of retention system strength

5.9.1.2 Helmet support

A steel plate fitted with a bolt. See Figure 6.

Dimensions in millimetres

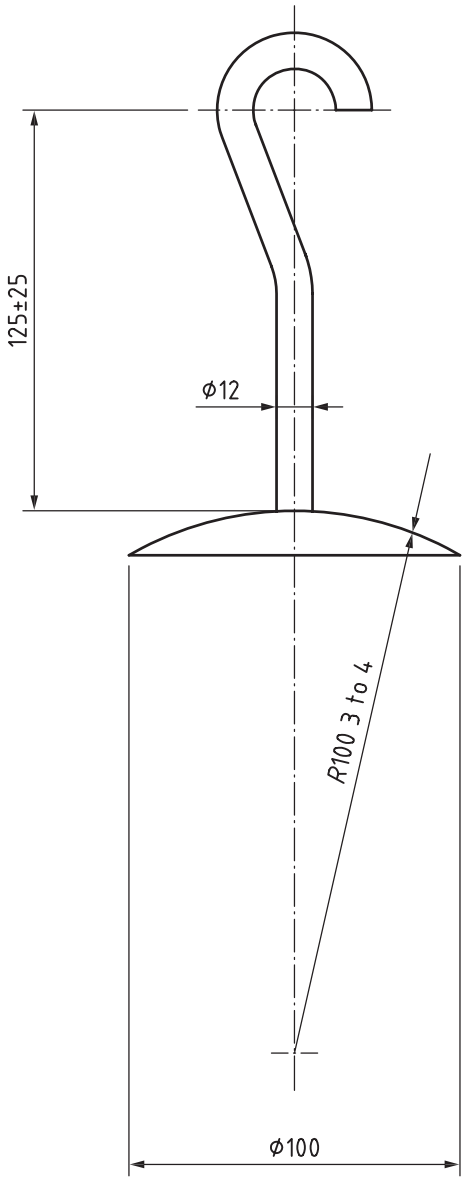


Figure 6 — Helmet support

5.9.1.3 Headforms and loadbearing device

The loadbearing device shall be aligned with the vertical axis passing through the centre of gravity of the headform.

The mass of the headform equipped with the loadbearing device shall be (15 ± 0,5) kg, which shall be the preloading on the retention system for determining the position from which the vertical displacement of the point of application of the force shall be measured. The guide and arrest device shall allow a weight with a mass of (10 ± 0,1) kg to drop in a guided free fall (200 ± 5) mm.

5.9.1.4 Measuring device

A device to measure the vertical displacement of the point of application of the force.

5.9.2 Procedure

Position the helmet as described in 5.5.

In this position the helmet shall be held by the shell by means of the helmet support at a point traversed by the vertical axis passing through the centre of gravity of the headform.

Release the drop weight and allow it to drop from a height of (200 ± 5) mm.

During the test measure, the dynamic displacement of the point of application of the force.

After 2 min measure the residual displacement of the point of application of the force.

5.10 Determination of retention system effectiveness

5.10.1 Apparatus

The apparatus shall comprise:

— a drop weight a mass of (10,0 ± 0,1) kg;

— a guiding system with a total mass of (3,0 ± 0,1) kg allowing the drop weight to drop in a guided free fall (175 ± 5) mm;

— a twisted steel wire and a hook attached to the guiding system running over a pulley with a diameter of 100 mm;

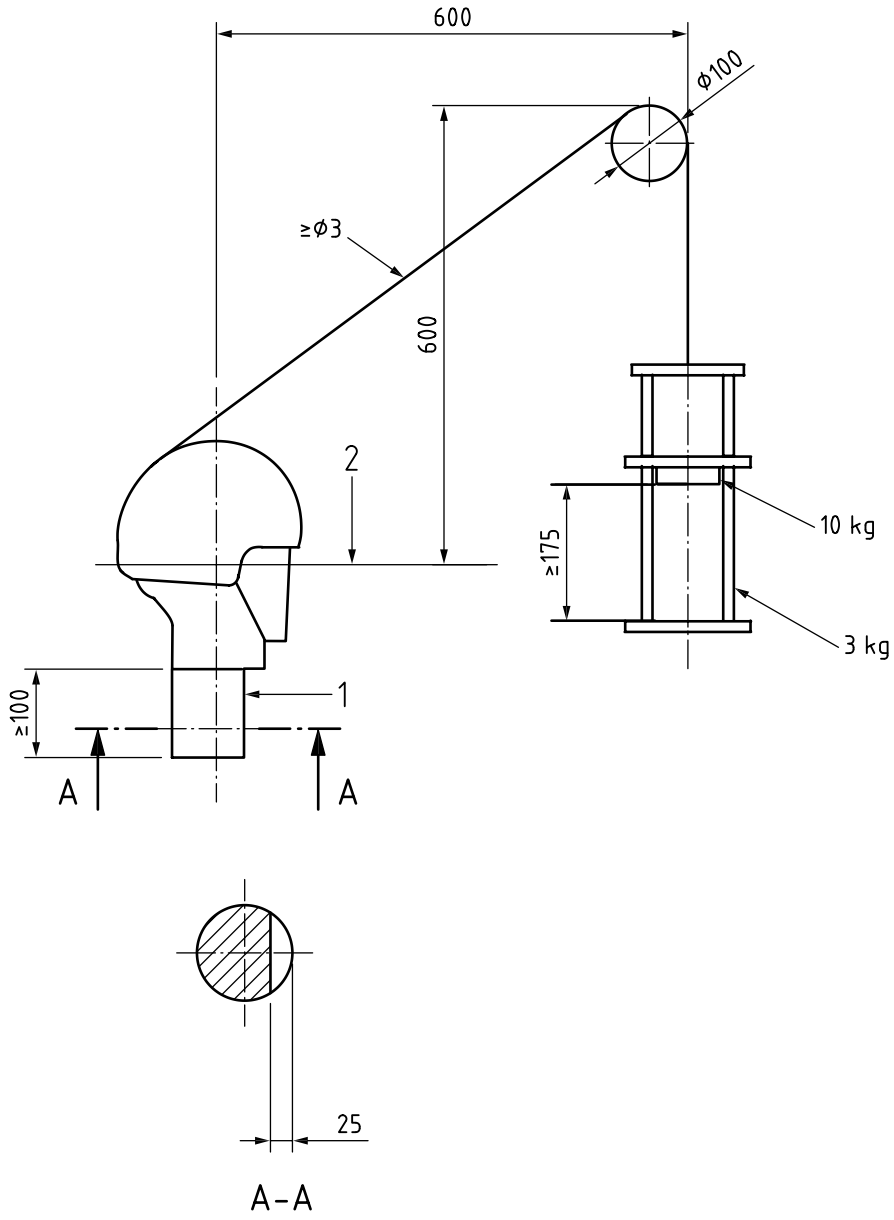
— headforms according to EN 960:2006;

— a base to hold the headforms.

The guiding device shall be such as to ensure that the impact speed is no less than 95 % of the theoretical speed.

Figure 7 shows the apparatus.

Dimensions in millimetres



Key

1 base
2 reference plane

Figure 7 — Apparatus for testing of the retention system effectiveness

5.10.2 Procedure

Test one helmet of each headform size, conditioned in accordance with 5.6.1, and fitted in accordance with the manufacturer's instructions.

Draw the chin strap as tight as possible.

Hook the twisted steel wire to the rear part of the helmet.

Release the drop weight and allow it to fall (175 ± 5) mm.

Observe if the helmet comes off.

5.11 Test report

The test report shall contain at least the following information:

a) identification details of the helmets tested including range of sizes and masses;

b) results of the tests;

c) date of testing;

d) name of the test laboratory.

6 Marking

Each helmet shall be permanently marked in such a way that the following information is clearly legible by the user and is likely to remain legible throughout the life of the helmet:

— the number of this European Standard;

— the name or trademark of the manufacturer;

— the designation of the model;

— the designation 'helmet for users of luge users in competition';

— the size or size range of the helmet, quoted as the circumference (in cm) of the head which the helmet is intended to fit;

— the weight of the helmet (the average mass in grams of the helmet size in question rounded to the nearest 50 g);

— year and quarter of manufacture.

In addition, if the shell is made of a material which is known to be adversely affected by contact with hydrocarbons, cleaning fluids, paints, transfers or other extraneous additions, the helmet shall carry an appropriate warning.

7 Information to be supplied by the manufacturer

With every helmet distinct information in the language(s) of the country of sale shall be furnished as follows:

— maintenance and cleaning;

— suitable accessories;

— information on suitable face-shields;

— that the helmet shall be adjusted to fit the wearer;

— how the helmet should rest on the head to ensure the intended protection (e.g. that it should be placed so as to protect the forehead and not be pushed too far back over the back of the head);

— that a helmet subjected to violent impact shall be discarded.

Annex A
(informative)

Alternative procedure for artificial ageing

The helmet submitted to artificial ageing should be exposed to the radiation of a xenon arc lamp. The radiant energy of the lamp should be filtered to provide a spectral power distribution that closely approximates that of terrestrial daylight.

The helmet should be fixed on a cylindrical holder concentric to the lamp and which rotates at a speed of 1 min^{-1} to 5 min^{-1} around its axis.

Each helmet which will subsequently be tested for shock absorption should be orientated so that the area of test should be directed towards the lamp. The plane tangential to the shell at this point should be normal to a radius of the cylindrical holder.

The radiant energy incident in the plane of the test areas should be either measured or calculated from information provided by the manufacturer of the test apparatus. The exposure interval should be adjusted so that the exposed samples should receive a total energy of 1 GJ/m^2 over the wavelength range 280 nm to 800 nm.

The samples should be sprayed with distilled or demineralised water (having a conductivity below 5 µS/cm) intermittently with a cycle of 18 min spraying and 102 min without spraying. During the latter periods the measured relative humidity should be (50 ± 5) %.

The temperature within the test chamber should be measured with a black standard thermometer placed at the same distance from the lamp as the exposed test areas of the helmets. The temperature should be maintained at (70 ± 3) °C.

All other test and calibration conditions for the apparatus should be in accordance with Method A of EN ISO 4892-1, EN ISO 4892-2 and EN ISO 4892-3.

NOTE 1 Not all available test apparatus, otherwise meeting the requirements of EN ISO 4892-1, EN ISO 4892-2 and EN ISO 4892-3, will incorporate sample holder frames of diameter sufficient to accommodate complete helmets.

NOTE 2 The position of the water sprays can require adjustment in order to avoid interference with the test samples.

NOTE 3 The energy output of the xenon arc should be capable of being reduced below normal operational levels so as to maintain acceptable intensities in the sample surface plane required by this procedure.

Annex B
(informative)

Significant technical changes between this European Standard and EN 13484:2001

The significant changes with respect to the first edition of EN 13484 are as listed below.

Table B.1 — Significant changes between this European Standard and EN 13484:2001

Clause/paragraph/table/figure	Change
Clause 2	The normative references in Clause 2 and in the text have been updated. EN 960 has been dated throughout the text.
Clause 3	Definitions for terms 3.8 and 3.9 have been updated.
Figure 1	Subtitle a) and keys 1 and 2 have been updated/extended.
4.3	EN 960 has been dated and sizes have been changed into size designations.
Table 1	Code letters have been changed to size designations and between brackets EN 960:1994 equivalent code letters. The values have been updated. An explanatory note has been added before the table.
Figure 2	Key 3 has been updated.
5.2, 2nd paragraph	Sizes have been changed into size designations.
Table 2	Code letters have been changed to size designations with equivalent code letters for reference. An explanatory note has been added before the table.
Figure 3	Key 7 has been extended.
Annex ZA	The Annex has been updated.

Table B.1 *(continued)*

Bibliography	A bibliography has been added according to references in Clause 3 and Annex A.
NOTE The technical changes referred include the significant technical changes from the revised EN but is not an exhaustive list of all modifications from the previous version.	

Annex ZA
(informative)

Relationship between this European Standard and the Essential Requirements of EU Directive 89/686/EEC Personal Protective Equipment

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association to provide a means of conforming to Essential Requirements of the New Approach Directive 89/686/EEC Personal Protective Equipment.

Once this standard is cited in the Official Journal of the European Union under that Directive and has been implemented as a national standard in at least one Member State, compliance with the clauses of this standard given in Table ZA.1 confers, within the limits of the scope of this standard, a presumption of conformity with the corresponding Essential Requirements of that Directive and associated EFTA regulations.

Table ZA.1 — Correspondence between this European Standard and the EU Directives

EU Directive 89/686/ECC, Annex II	Clauses of this European Standard	Qualifying remarks/notes
1.2.1 Absence of risks and other inherent nuisance factors	4.2.2.1, 4.2.2.2, 4.2.2.3, 4.3, 4.6.2	
1.2.1.1 Suitable constituent materials	4.1	
1.2.1.3 Maximum permissible user impediment	4.2.3	
1.3.2 Lightness and design strength	5.6	
1.4 Information supplied by the manufacturer	6, 7	
2.1 PPE incorporating adjustment systems	4.6.1	
2.12 PPE bearing one or more identification or recognition marks directly or indirectly relating to health and safety	6	
3.1.1 Impact caused by falling or projecting objects and collision of parts of the body with an obstacle	4.4, 4.5	

Bibliography

[1] EN 1077:2007, *Helmets for alpine skiers and snowboarders*

[2] EN ISO 4892-1, *Plastics — Methods of exposure to laboratory light sources — Part 1: General guidance (ISO 4892-1)*

[3] EN ISO 4892-2, *Plastics — Methods of exposure to laboratory light sources — Part 2: Xenon-arc lamps (ISO 4892-2)*

[4] EN ISO 4892-3, *Plastics — Methods of exposure to laboratory light sources — Part 3: Fluorescent UV lamps (ISO 4892-3)*

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