



SLOVENSKI STANDARD
SIST EN 966:2012+A1:2012
01-december-2012

Čelade za športne aktivnosti v zraku

Helmets for airborne sports

Luftsporthelme

Casques de sports aériens

iteh STANDARD PREVIEW
(standards.iteh.ai)

Ta slovenski standard je istoveten z: EN 966:2012+A1:2012

[SIST EN 966:2012+A1:2012](https://standards.iteh.ai/catalog/standards/sist/0d9d3e9b-b825-441f-ac54-92460fe346c0/sist-en-966-2012a1-2012)

<https://standards.iteh.ai/catalog/standards/sist/0d9d3e9b-b825-441f-ac54-92460fe346c0/sist-en-966-2012a1-2012>

ICS:

13.340.20	Varovalna oprema za glavo	Head protective equipment
97.220.40	Oprema za športe na prostem in vodne športe	Outdoor and water sports equipment

SIST EN 966:2012+A1:2012

en,fr,de

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN 966:2012+A1:2012](https://standards.iteh.ai/catalog/standards/sist/0d9d3e9b-b825-441f-ae54-92460fe346c0/sist-en-966-2012a1-2012)
<https://standards.iteh.ai/catalog/standards/sist/0d9d3e9b-b825-441f-ae54-92460fe346c0/sist-en-966-2012a1-2012>

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 966:2012+A1

October 2012

ICS 13.340.20

Supersedes EN 966:2012

English Version

Helmetts for airborne sports

Casques de sports aériens

Luftsporthelme

This European Standard was approved by CEN on 17 December 2011 and includes Amendment 1 approved by CEN on 19 July 2012.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

(standards.iteh.ai)

[SIST EN 966:2012+A1:2012](https://standards.iteh.ai/catalog/standards/sist/0d9d3e9b-b825-441f-ac54-92460fe346c0/sist-en-966-2012a1-2012)

<https://standards.iteh.ai/catalog/standards/sist/0d9d3e9b-b825-441f-ac54-92460fe346c0/sist-en-966-2012a1-2012>



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

Management Centre: Avenue Marnix 17, B-1000 Brussels

Contents	Page
Foreword	4
Introduction	5
1 Scope	6
2 Normative references	6
3 Terms and definitions	6
4 Materials	8
5 Construction	8
5.1 General	8
5.2 Retention system	9
5.2.1 General	9
5.2.2 Chin straps	9
5.2.3 Fastening devices	9
5.3 Finish.....	9
5.4 Field of vision	9
5.5 Head mobility.....	9
5.6 Eye protection.....	10
6 Performance requirements	10
6.1 General	10
6.2 Impact absorbing capacity within the test area	10
6.2.1 Shock absorbing capacity.....	10
6.2.2 Resistance to penetration.....	10
6.3 Retention system performance.....	10
6.3.1 Retention system strength.....	10
6.3.2 Retention system effectiveness	10
6.3.3 Release of the retention system.....	11
6.3.4 Assemblies	11
7 Tests	11
7.1 Sequence and number of samples to be tested	11
7.2 Determination of impact absorbing capacity	11
7.2.1 Test area	11
7.2.2 Conditioning	12
7.2.3 Shock absorption test	12
7.2.4 Penetration resistance test	13
7.3 Retention system testing	15
7.3.1 Determination of retention system strength	15
7.3.2 Determination of retention system effectiveness.....	16
7.4 Determination of field of vision	16
7.5 Test report	16
8 Marking	17
9 Information for users	17
Annex A (normative) Positioning of the helmet on the headform	22
Annex B (normative) Test area	23
Annex C (normative) Field of vision	25
Annex D (informative) Alternative procedure for artificial ageing	28

Annex E (informative) Significant technical changes between this European Standard and EN 966:1996	29
Annex ZA (informative) Relationship between this European Standard and the Essential Requirements of EU Directive 89/686/EEC Personal Protective Equipment	30
Bibliography	31

iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST EN 966:2012+A1:2012](https://standards.iteh.ai/catalog/standards/sist/0d9d3e9b-b825-441f-ae54-92460fe346c0/sist-en-966-2012a1-2012)
<https://standards.iteh.ai/catalog/standards/sist/0d9d3e9b-b825-441f-ae54-92460fe346c0/sist-en-966-2012a1-2012>

EN 966:2012+A1:2012 (E)**Foreword**

This document (EN 966:2012+A1:2012) 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 April 2013, and conflicting national standards shall be withdrawn at the latest by April 2013.

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 includes Amendment 1 approved by CEN on 19 July 2012.

This document supersedes A1 EN 966:2012 A1.

The start and finish of text introduced or altered by amendment is indicated in the text by tags A1 A1.

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

<https://standards.iteh.ai/catalog/standards/sist/0d9d3e9b-b825-441f-ae54-92460fe346c0/sist-en-966-2012a1-2012>

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, Former Yugoslav Republic of Macedonia, 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 protection given by a helmet depends on the circumstances of the accident and wearing a helmet cannot always prevent death or long term 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 may be damaged in absorbing this energy and any helmet that sustains a severe blow needs to 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 tension at all times.

iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST EN 966:2012+A1:2012](https://standards.iteh.ai/catalog/standards/sist/0d9d3e9b-b825-441f-ae54-92460fe346c0/sist-en-966-2012a1-2012)

<https://standards.iteh.ai/catalog/standards/sist/0d9d3e9b-b825-441f-ae54-92460fe346c0/sist-en-966-2012a1-2012>

EN 966:2012+A1:2012 (E)**1 Scope**

This European Standard specifies requirements and test methods for protective helmets used in paragliding, hang gliding and flying with ultra-light aeroplanes.

Helmets for airborne sports are indicated in this European Standard as follows:

- category HPG: Helmets for paragliding and hang gliding;
- category UL: Helmets for flying with ultra-light aeroplanes.

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

- construction including chin strap, fastening devices, field of vision, head mobility and eye protection;
- penetration resistance;
- shock-absorbing properties;
- retention system properties;
- marking and information for users.

NOTE The requirements cover both categories. Special requirements are contained in the relevant clauses.

This European Standard does not apply to other kinds of head protection used in airborne sports.

[SIST EN 966:2012+A1:2012](https://standards.iteh.ai/catalog/standards/sist/0d9d3e9b-b825-441f-ac54-92460fe346c0/sist-en-966-2012a1-2012)

2 Normative references

[A1] 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. **[A1]**

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**

helmet primarily intended to protect the wearer's head against impact; some helmets can provide additional protection

3.2**shell**

material that provides the general outer form of the helmet

3.3**helmet type**

category of helmets which does not differ in such essential respects as:

- the trade name or mark;
- the materials or dimensions of the shell, of the retention system or of the protective padding.

However, a helmet type may 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

3.4.1 protective padding

material used to absorb impact energy

3.4.2 comfort padding

liner material provided for the wearer's comfort

3.4.3 sizing padding

liner material used for adjustment of the fit of the helmet to the wearer's head

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

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

3.7 headform

for definition, see EN 960:2006

3.8 basic plane of the human head

plane at the level of the external ear opening (external auditory meatus) and the lower edge of the eye sockets (orbits)

3.9 basic plane of a headform

plane relative to the headform that represents the basic plane of the human head

3.10 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

3.11 test area

area of the headform in which impact tests may be conducted which represents the minimum protected area of the human head

EN 966:2012+A1:2012 (E)**3.12****chin cup**

accessory or part of the chin strap designed to fit on the point of the wearer's chin (menton) to locate the strap

3.13**visor**

transparent protective screen extending over both eyes and covering part of the face

3.14**goggles**

transparent protectors that enclose the eyes

4 Materials

For those parts of the helmet coming into contact with the skin no material shall be used which is known to undergo appreciable alteration from contact with sweat or substances likely to be found in toiletries. Materials shall not be used which are known to cause skin disorders, including injuries from contact with cold surfaces which are related to the thermal conductivity of the material.

5 Construction**5.1 General****iTeh STANDARD PREVIEW**

The helmet normally consists of a shell, either containing or providing the necessary means of absorbing impact energy, and either fitted with or providing means for retaining the helmet on the head in an accident.

The helmet shall be so designed and constructed as to be capable of withstanding normal handling and use within the limits of the instruction accompanying it.

The helmet shall be so designed that none of its parts nor any accessories fitted to or incorporated in it are likely to injure the user during normal use.

If the helmet is designed to form an integral assembly together with a headset, a visor or other devices to be attached, so that any use without these attachments is not intended, all requirements specified in Clause 5 shall apply for the complete assembly. A clear marking shall be placed on the product indicating that the helmet shall only be used in combination with the attachment(s). The information for users shall provide detailed instructions regarding the attachment of devices to be used in combination with the helmet.

The construction of helmets of category HPG shall be so designed as to minimize the risk that the lines, risers or other straps of the paraglider might become entangled by the helmet including any of its parts or accessories.

NOTE Helmets should:

- have low weight;
- be easy to put on and take off;
- be usable together with spectacles;
- not significantly interfere with the ability of the user to receive acoustic ambient information (not relevant for helmets category UL, which should be protected against noise and should enable radio communication).

5.2 Retention system

5.2.1 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.

5.2.2 Chin straps

Any chin strap shall be not less than 15 mm wide.

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

If the chin strap includes a chin cup all the tests shall be performed with the chin cup.

5.2.3 Fastening devices

Any chin strap shall be fitted with a device to adjust and maintain tension in the strap. The device should be capable of adjustment so it does not come on the jaw bone.

5.3 Finish

All edges shall be smooth and rounded. There shall be no rigid projections on the inside of the helmet. Any external projection shall not exceed 5 mm and shall be smoothly faired to the adjacent surface. Projections of category UL helmets needed for microphone boom assemblies, multiple visor systems and ear cup tensioning devices may be higher than 5 mm if their contour is smooth and rounded with no edges curved with a radius which is less than half of the height of the projection.

5.4 Field of vision

SIST EN 966:2012+A1:2012

<https://standards.iteh.ai/catalog/standards/sist/0d9d3e9b-b825-441f-ae54-794494494494>

When tested in accordance with 7.4 there shall be no occultation in the field of vision bounded by (see Annex C, Figure C.1, Figure C.2 and Figure C.3):

- horizontally: two segments of dihedral angles symmetrical in relation to the median longitudinal vertical plane of the headform and situated between the reference and the basic planes. Each of these dihedral angles is defined by the longitudinal vertical median plane of the headform and the vertical plane forming an angle of not less than 105° with the median longitudinal vertical plane and whose edge is the straight line L-K;
- upwards: a dihedral angle defined by the reference plane of the headform and a plane forming an angle of not less than 25° in the case of helmets category HPG, and 7° in the case of helmets category UL, with the reference plane, and whose edge is straight line L1-L2, the points L1 and L2 representing the eyes;
- downwards: a dihedral angle defined by the basic plane of the headform and a plane forming an angle of not less than 45° with the basic plane and whose edge is the straight line K1-K2.

5.5 Head mobility

When the helmet is mounted on the appropriate headform as described in Annex A, then the rigid parts of the rear and, in particular, the shell shall not be within a horizontal cylinder as illustrated in Annex B, Figure B.1, and defined as follows:

- diameter 100 mm;

EN 966:2012+A1:2012 (E)

- axis, situated at the intersection of the median plane of symmetry of the headform and of a plane parallel to and 110 mm below the reference plane.

5.6 Eye protection

The helmet shall be so designed and constructed that:

- helmets category HPG can be used together with goggles;
- helmets category UL can be used together with goggles, except when the helmet is equipped with a visor.

6 Performance requirements**6.1 General**

After the performance of one of the prescribed tests, the helmet shall not exhibit any breakage or deformation dangerous to the wearer.

6.2 Impact absorbing capacity within the test area

The helmet shall give protection to the user's forehead, back of the head, temples and crown of the head, when tested in accordance with 7.2.

6.2.1 Shock absorbing capacity

When tested in accordance with 7.2.3 the peak acceleration shall not, for each impact, exceed 250 g for the equivalent velocity to a drop height of 1 500 mm after conditioning in accordance with any of the procedures described in 7.2.2.

6.2.2 Resistance to penetration

When tested in accordance with 7.2.4, the head of the punch shall not come closer than 5 mm, measured vertically, to the headform, after conditioning in accordance with any of the procedures described in 7.2.2.

6.3 Retention system performance**6.3.1 Retention system strength**

When tested by the method described in 7.3.1, 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 a requirement.

6.3.2 Retention system effectiveness

When tested by the procedure described in 7.3.2 the helmet, selected to be of appropriate size, shall not come off the headform.