



# SLOVENSKI STANDARD

## oSIST prEN 1078:2023

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### Čelade za kolesarje

Helmets for cyclists

Helme für Radfahrer

Casques pour cyclistes

Ta slovenski standard je istoveten z: **prEN 1078**

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13.340.20	Varovalna oprema za glavo	Head protective equipment
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English Version

## Helmets for cyclists

Casques pour cyclistes

Helme für Radfahrer

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 158.

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

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## European foreword

This document (prEN 1078:2023) has been prepared by Technical Committee CEN/TC 158 “Head protection”, the secretariat of which is held by SIS.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 1078:2012+A1:2012.

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

- In this revision we analysed different hazards related to head impact situations for cyclists and the most common risks associated with them.
- Requirements for rotational shock absorption at impacts are added;
- Normative reference to test method for impacts with a tangential component has been included;
- Inclusion head injury criteria;
- The impact speeds used in the different tests are based on available information in literature and risk analysis;
- Inclusion of a method to evaluate the impact protection of a chin guard.

The standard has been prepared under the standardization request M/571 given to CEN by the European Commission and the European Free Trade Association and supports essential requirements of Regulation (EU) 2016/425.

For relationship with EU Regulation (EU) 2016/425, see informative Annex ZA, which is an integral part of this document.

## Introduction

This document specifies the requirements for protective headwear for use in cycle, skateboard, roller skates, kick scooter and similar activities.

The requirements in this document are concerned with the performance of a helmet to reduce the risk of injury to the skull, brain and part of the head within the specified area of protection. 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.

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.

Cycle related activities can result in a broad spectrum of accident situations. Most accident statistics relates to cycle accidents and less is written about the accident situation for other activities such as skateboard, roller skates and kick scooters. Depending on the cycle accident situation the helmet and head can be loaded in compression and also with a tangential force leading to rotation of the helmet and head. The most common cycle accident for adult cyclists are single accidents to the ground and interactions with cars. For recreational cyclists the impact surface can alter from asphalt, gravel and other impact surfaces in mountain cycle related situations. The impact speed also differs a lot from commuting to road cycle situation. To capture the overall accident situation, the test methods defined in this document are designed to take as many aspects as possible into account without restricting the usability of the helmet.

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.

At the time this document was prepared, no standardized method for measuring the ventilating capacity of a helmet was recognized. For that reason no requirements concerning ventilation or heat transmission have been introduced. Manufacturers of helmets are urged to design their helmets to encourage a flow of air over the wearer's head.

Helmets for users of cycles and other equipment for transport with similar hazards, for example skateboards, roller skates and kick scooters are fitted with a retention system to retain the helmet on the head. However, there can be a foreseeable risk that helmets of young children could become trapped and thereby cause a risk of strangulation of the child. In such cases an impact protection helmet for young children (see EN 1080) should be used.

## 1 Scope

This document specifies requirements and test methods for helmets worn by users of cycles and other equipment for transport with similar hazards, for example skateboards, roller skates and kick scooters.

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

- construction, including field of vision;
- shock absorbing properties;
- retention system properties, including chin strap and fastening devices;
- marking and information.

This document is not applicable for helmets for young children to be used when there is a risk of strangulation.

## 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 ISO 13688:2013, *Protective clothing - General requirements (ISO 13688:2013)*

ISO 6487:2015, *Road vehicles — Measurement techniques in impact tests — Instrumentation*

prEN 17950:2023, *Protective helmets — Test methods — Shock absorption including measuring rotational kinematics*

## 3 Terms and definitions

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

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

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

### 3.1

#### **protective helmet**

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

### 3.2

#### **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* (3.4) or of the *protective padding* (3.3.1)

**prEN 1078:2023 (E)****3.3  
padding****3.3.1****protective padding**

material used to absorb impact energy

**3.3.2****sizing padding**

lining material used for adjustment of the helmet size

**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, sizing or to enhance the wearer's comfort

**3.5****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

**3.6****basic plane**

for a given headform, horizontal plane located at a vertical distance 'x' below and parallel to the *reference plane* (3.7)

Note 1 to entry: This corresponds to the basic plane of the human head being the longitudinal plane which passes through the lower level of the eye orbits and the upper level of the external opening of the ear canals.

[SOURCE: EN 960:2006, 2.10] <https://standards.iteh.ai/catalog/standards/sist/1925a539-0733-4b64-a947-26fd0c9ebd90/osist-pren-1078-2023>

**3.7****reference plane**

construction plane parallel to the *basic plane* (3.6) at a distance from it which is a function of the size of the headform

Note 1 to entry: All horizontal datum levels are quoted relative to this plane.

[SOURCE: EN 960:2006, 2.5]

**3.8****test area**

area of the helmet in which impact tests are conducted which corresponds to the minimum protected area of the human head



### 3.9

#### **accessories**

additional device(s) which can be attached to the helmet and are intended to be removable by the user, but which provide no protective function to the wearer

EXAMPLE      Helmet accessory can be a lamp, camera etc.

### 3.10

#### **non-integral additional protective devices**

additional protective device(s) supplied or recommended by the manufacturer which can be attached to the helmet and intended to be removable by the user

EXAMPLE      (sun)visors

### 3.11

#### **protective lower face cover (chin guard)**

detachable, movable or integral (permanently fixed) part of the helmet covering the lower part of the face and intended to protect the chin of the user against impact

### 3.12

#### **linear shock absorption**

head protection towards direct head impact. Evaluated with a flat and kerbstone anvil

### 3.13

#### **rotational shock absorption**

head protection towards oblique head impact. Evaluated with an angled anvil

### 3.14

#### **Pilz plane**

plane on the headform angled 10° from the *reference plane* (3.7) at the rear of the head at the intersection of the reference plane and the midsagittal plane

[SOURCE: prEN 17950:2023, 3.3]

## 4 Requirements

### 4.1 Materials innocuousness

The material requirements shall be verified during inspection in 5.2, by safety data sheets provided in documents supplied by the manufacturer.

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

The material used in those parts of the helmet coming, or that can come into contact with the skin, shall not be known to cause skin disorders or other adverse effects on health in accordance with, EN ISO 13688:2013, 4.2.

**prEN 1078:2023 (E)****4.2 Construction**

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.

The helmet shall withstand handling. The helmet shall be so designed and shaped that its parts, such as visor, rivets, ventilators, edges, fastening device and the like, are not likely to injure the user in reasonably foreseeable use.

**4.3 Field of vision**

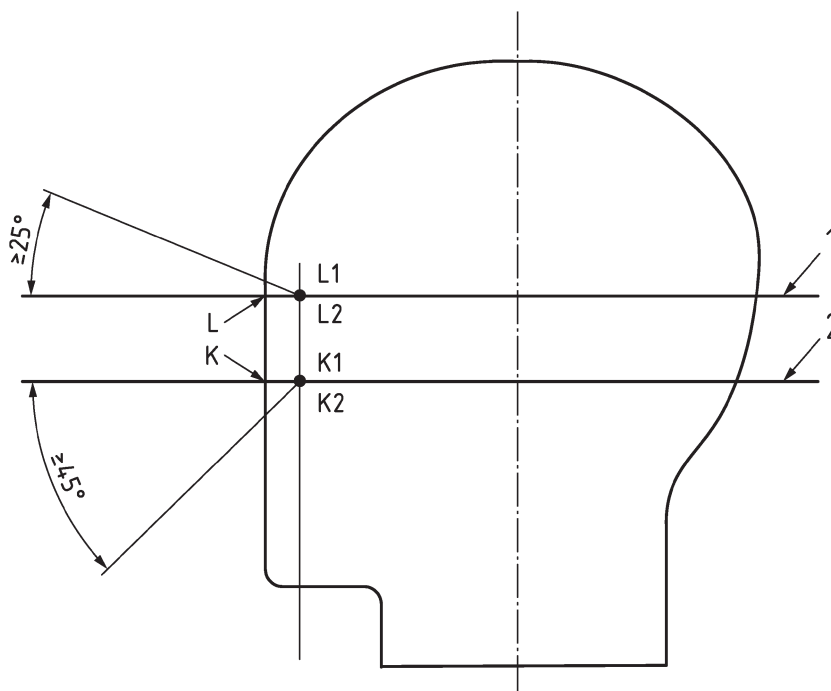
When tested in accordance with 5.6 there shall be no occultation in the field of vision bounded by angles as follows (see Figure 1):

- a) horizontally: min. 105° from the longitudinal vertical median plane to the left and right hand sides;
- b) upwards: min. 25° from the reference plane (3.7);
- c) downwards: min. 45° from the basic plane (3.6).

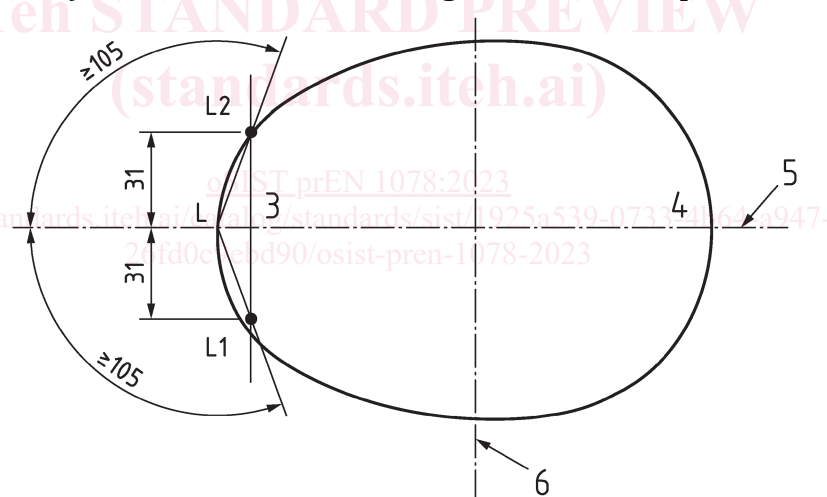
iTeh STANDARD PREVIEW  
(standards.iteh.ai)

<https://standards.iteh.ai/catalog/standards/sist/1925a539-0733-4b64-a947-26fd0c9ebd90/osist-pren-1078-2023>

Dimensions in millimetres



a) Section of headform in longitudinal vertical plane



b) Section of headform in reference plane

**Key**

- |                   |                                      |
|-------------------|--------------------------------------|
| 1 reference plane | 4 back                               |
| 2 basic plane     | 5 longitudinal vertical median plane |
| 3 front           | 6 central transverse vertical plane  |

NOTE 1 Longitudinal vertical median plane – equivalent to EN 960:2006, 2.8 “vertical longitudinal plane”.

NOTE 2 Central transverse vertical plane – equivalent to EN 960:2006, 2.9 “vertical transverse plane”.

**Figure 1 — Field of vision**

**prEN 1078:2023 (E)****4.4 Shock absorbing capacity****4.4.1 General**

The helmet shall have a means of absorbing impact energy.

When tested in accordance with 5.3.1 and 5.3.2 the peak linear acceleration shall not exceed 250g and the peak angular velocity shall not exceed 35 rad/s.

**4.4.2 Linear shock absorption**

The helmet shall give linear shock absorption (3.12) to the forehead, rear, sides, temples, crown and, if equipped with a protective lower face cover, the chin of the head.

When tested in accordance with 5.3.1, the velocity shall be  $5,42 \text{ m/s } \begin{smallmatrix} +0,1 \\ 0 \end{smallmatrix}$  m/s on the flat anvil and  $4,57 \text{ m/s } \begin{smallmatrix} +0,1 \\ 0 \end{smallmatrix}$  m/s on the kerbstone anvil. In case a helmet is equipped with a protective lower face cover, the helmet is tested for a velocity of  $4,57 \text{ m/s } \begin{smallmatrix} +0,1 \\ 0 \end{smallmatrix}$  m/s on the flat anvil.

NOTE These are theoretically equivalent to 1 497 mm and 1 064 mm drop heights respectively.

**4.4.3 Rotational protection**

The helmet shall give rotational protection along X, Y and Z head rotation (See Figure 5 and 6).

When tested in accordance with 5.3.2, the velocity shall be  $6,50 \text{ m/s } \begin{smallmatrix} +0,1 \\ 0 \end{smallmatrix}$  m/s on the oblique anvil.

NOTE This is theoretically equivalent to 2153 mm drop height.

**4.5 Durability**

The helmet shall be inspected according to 5.2.2 to not exhibit damage that could cause significant injury to the wearer's head when the helmet is worn (internal sharp edges, points) after being tested according to 5.3.

**4.6 Retention system****4.6.1 General**

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 5.4 and 5.5.

The retention system shall remain fastened, and the helmet shall remain on the headform when tested according to 5.3.

**4.6.2 Chin strap**

The chin strap (3.5) shall not include a chin cup.

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

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

**4.6.3 Fastening device**

Any retention system shall be fitted with a device to adjust and maintain tension in the system. The device shall be capable of adjustment so that the fastening device does not sit on the jawbone and the fastening device cannot be detached from the chin strap.