



SLOVENSKI STANDARD
SIST EN 13087-1:2000

01-september-2000

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Protective helmets - Test methods - Part 1: Conditions and conditioning

Schutzhelme - Prüfverfahren - Teil 1: Bedingungen und Vorbehandlung

Casques de protection - Méthodes d'essai - Partie 1: Conditions et conditionnement

Ta slovenski standard je istoveten z: EN 13087-1:2000

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ICS:

13.340.20 Varovalna oprema za glavo Head protective equipment

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en

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English version

Protective helmets - Test methods - Part 1: Conditions and conditioning

Casques de protection - Méthodes d'essai - Partie 1:
Conditions et conditionnement

Schutzhelme - Prüfverfahren - Teil 1: Bedingungen und
Vorbehandlung

This European Standard was approved by CEN on 14 January 2000.

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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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

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Foreword

This European Standard 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of an identical text or by endorsement, at the latest by September 2000, and conflicting national standards shall be withdrawn at the latest by September 2000.

This European Standard 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 standard.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

This European Standard is the first Part of EN 13087 which supports essential requirements of EU Directive(s) and consists of ten Parts as follows:-

- Part 1 : Conditions and conditioning [SIST EN 13087-1:2000](https://standards.iteh.ai/catalog/standards/sist/en-13087-1-2000)
- Part 2 : Shock absorption <https://standards.iteh.ai/catalog/standards/sist/3719e1b5-3ad8-48b9-b8c6-606538fc5190/sist-en-13087-1-2000>
- Part 3 : Resistance to penetration
- Part 4 : Retention system effectiveness
- Part 5 : Retention system strength
- Part 6 : Field of vision
- Part 7 : Flame resistance
- Part 8 : Electrical properties
- Part 9 : Mechanical rigidity
- Part 10 : Resistance to radiant heat

Introduction

This standard is intended as a supplement to the specific product standards for protective helmets.(helmet standards). This method or other test methods may be applicable to specified for complete helmets or parts thereof, and may be referenced in the appropriate helmet standards.

Performance requirements are given in the appropriate helmet standard, as are such prerequisites as the number of samples, preconditioning, preparation of samples for the tests, sequence and duration of testing and assessment of test results. If deviations from the test method given in this standard are necessary, these deviations will be specified in the appropriate helmet standard.

1 Scope

This European Standard describes methods of test for protective helmets. The purpose of these tests is to enable assessment of the performance of the helmet as specified in the appropriate helmet standard.

This European Standard specifies conditions and conditioning to be used when testing protective helmets.

2 Terms and definitions

For the purposes of this European Standard, terms and definitions used in this standard may be found in the appropriate helmet standard.

3 Prerequisites

In order to implement this European Standard, at least the following parameters shall be specified in the appropriate helmet standard:-

- a) number of samples
- b) preparation of samples
- c) sequence of conditioning
- d) sequence of tests
- e) temperatures to be used

4 Test methods

4.1 General

Several methods are specified. The appropriate helmet standard will state which of these method(s) is/are applicable.

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4.2 Testing atmosphere

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Testing in accordance with all Parts of EN 13087 shall be performed in an atmosphere with a temperature of $(22 \pm 5)^\circ \text{C}$ and a relative humidity of $(55 \pm 30)\%$. This atmosphere may be referred to as laboratory ambient conditions.

4.3 Conditioning cabinet

The temperature and artificial ageing conditioning cabinets shall be sufficiently large to ensure that the helmets do not touch one another or the sides of the cabinet. They shall be fitted with a fan to ensure effective air circulation.

4.4 High temperature conditioning

Samples shall be maintained at one of the following temperatures, as specified in the appropriate helmet standard, for a period of time between 4 h and 24 h.

(+50 °C or +40 °C) with a tolerance of ± 2 °C in each case.

4.5 Low temperature conditioning

Samples shall be maintained at one of the following temperatures, as specified in the appropriate helmet standard, for a period of time between 4 h and 24 h:-

(0, -10, -20, -30, -40) °C, with a tolerance of ± 2 °C in each case.

4.6 Water conditioning

Samples shall be water conditioned by one of the following methods, as specified in the appropriate helmet standard. Tap water at a temperature not greater than 27°C shall be used for both methods.

Method 1. The sample shall be totally immersed in water for a period of time between 4 h and 24 h.

Method 2. The sample shall be sprayed over its outer surface at a rate of nominally 1 l/min for a period of time between 4 h and 24 h.

4.7 Artificial ageing

4.7.1 Principle

The sample helmet is exposed to a specified irradiation from a xenon arc lamp.

4.7.2 Apparatus

A fused silica envelope, high pressure xenon lamp of 450 watt nominal power, operated in accordance with the lamp manufacturer's instructions.

NOTE : A suitable lamp reference is XBO-450W/4.

A means to ensure that the air temperature, measured at the sample position, does not exceed 50°C.

A means to support the helmets so that they are exposed to the radiation.

4.7.3 Procedure

Secure the helmet so that the plane tangential to the crown of the helmet is perpendicular to the direction of radiation from the lamp and the distance between the crown of the helmet and the arc of the lamp is (150 ± 5) mm.

Expose the sample to the radiation for (400 ± 4) h.

Remove the sample and allow it to return to laboratory ambient conditions (4.2).

NOTE : A further method for artificial ageing is described in Annex A.

Annex A (informative) Artificial ageing - Procedure

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 to 5 r/min around its axis.

Each helmet which will subsequently be tested for shock absorption or for penetration 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 receive a total energy of 1 GJ/m^2 over the wavelength range 280 to 800 nm.

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

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 $(70 \pm 3) ^\circ\text{C}$.

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

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

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

NOTE 3: The energy output of the Xenon arcs 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.

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