SLOVENSKI STANDARD
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Varovalne ļ elade - Preskusne metode - 8. del: Elektriļ ne lastnosti

Protective helmets - Test methods - Part 8: Electrical properties

Schutzhelme - Prüfverfahren - Teil 8: Elektrische Eigenschaften

Casques de protection - Méthodes d'essai - Partie 8: Propriétés électriques

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Protective helmets - Test methods - Part 8: Electrical properties

Casques de protection - Méthodes d'essai - Partie 8: Propriétés électriques

Schutzhelme - Prüfverfahren - Teil 8: Elektrische Eigenschaften

This European Standard was approved by CEN on 14 July 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.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
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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of an identical text or by endorsement, at the latest by April 2001, and conflicting national standards shall be withdrawn at the latest by April 2001.

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.

It consists of ten Parts as follows:

Part 1 : Conditions and conditioning
Part 2 : Shock absorption
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). Test methods may be applicable to complete helmets or parts thereof, and may be referenced in the other helmet standards.

Performance requirements are given in the appropriate helmet standard, as are such details 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 standard specifies the methods of test for electrical properties

2 Normative references

This European Standard incorporates, by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to, or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN 13087-1 Protective helmets - Test methods - Part 1 : Conditions and conditioning

3 Terms and definitions

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

4 Prerequisites

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

a) performance requirements
b) number of samples
c) preparation of samples
d) sequence of conditioning
e) sequence of tests
f) method(s) of test - 5.3 and/or 5.4 and/or 5.5

5 Methods

5.1 General

Testing shall be performed in ambient conditions specified in EN 13087-1.
When the test method specifies that the helmet shall be fitted to a headform, this shall be done in accordance with the manufacturer's fitting instructions, if supplied. If none are supplied, the helmet shall be fitted so as to simulate typical fitting in use.

Three test methods are specified.

The method given in 5.2 is intended to simulate closely the in-use situation - that is, the leakage current to the wearer via a live conductor touching the shell.

The method given in 5.3 is dependent only upon the transverse resistance of the shell (thickness). This effectively precludes the use of a metal shell and of holes or metal fasteners passing through the shell.

The method given in 5.4 is dependent only upon the surface resistance of the shell and effectively precludes the use of shells which have a conductive surface (eg metal electro-plating). This test is deemed to be necessary in order to obviate the danger to the wearer should he/she try to remove a helmet whose shell is in contact with a live conductor.

The method(s) to be used is/are specified in the helmet standard.

5.2 Conductive headform test

5.2.1 Principle

The leakage current between the outside and inside of the complete helmet and retention system, (as supplied by the helmet manufacturer) is measured at a specified voltage, when the helmet is mounted on a metal headform.

5.2.2 Procedure

Immerse the complete sample helmet and retention system in fresh tap water at room temperature for a period of (15 ± 2) min. Remove the helmet from the water and allow to drain for between 1 and 2 min max.

Mount the sample helmet on an appropriate sized aluminium headform, in the manner it is intended to be worn, and secure firmly with the retention system.

Apply an alternating test voltage at nominally 50 Hz or 60 Hz between the aluminium headform and a suitably insulated hand-held metal probe of 4 mm diameter and with a hemispherical radiused end.

Apply the probe at any point on the external surface of the helmet shell situated at, or above, its lower edge.

At each test point, increase the voltage at a steady rate to (1200 ± 25) Vac within 1 min and maintain it at this value for (15 ± 2) s. Record the leakage current at this voltage to the nearest 0,1 mA, together with any evidence of breakdown.

Repeat the test in order to investigate at least three test points.

5.2.3 Test report

Report the leakage currents measured, together with any occurrences of breakdown.

5.3 Wet helmet insulation test

5.3.1 Principle

The leakage current between the outside and inside of the helmet shell is measured at a specified voltage.

5.3.2 Procedure

Place the helmet shell in a (3 ± 0,2) g/l solution of sodium chloride at a temperature of (22 ± 5)° C for (24 ± 0,5) h. Remove the helmet shell, wipe it and place it upside down in a container of appropriate size. Fill the container and the helmet shell with the sodium chloride solution, up to 10 mm below the lowest point on the lower (as worn) edge of the shell.

Where necessary, adjust the orientation of the helmet shell in the sodium chloride solution in order to accommodate shells whose lower edge is not straight.

Apply an alternating test voltage at nominally 50 Hz or 60 Hz between an electrode immersed in the solution inside the helmet shell and another electrode in the container, outside of the helmet shell.

Increase the voltage at a steady rate to (1200 ± 25) Vac within 1 min and maintain it at this value for (15 ± 2) s. Record the leakage current at this voltage to the nearest 0,1 mA, together with any evidence of breakdown.

5.3.3 Test report

Report the leakage currents measured, together with any occurrences of breakdown.

5.4 Surface insulation test

5.4.1 Principle

The leakage current between any two points on the surface of the helmet shell is measured at a specified voltage.

5.4.2 Procedure

Ensure that the shell of the helmet is dry before the test.

Apply an alternating test voltage at nominally 50 Hz or 60 Hz between two suitably insulated hand-held metal probes of 4 mm diameter and with hemispherical radiused ends.

Apply the probes to any two points on the surface of the helmet shell (inside and/or outside) located not closer than 20 mm to each other.

At each test point, increase the voltage at a steady rate to (1200 ± 25) Vac within 1 min and maintain it at this value for (15 ± 2) s. Record the leakage current at this voltage to the nearest 0,1 mA, together with any evidence of breakdown.

Repeat the test in order to investigate at least three test points.

5.4.3 Test report

Report the leakage currents measured, together with any occurrences of breakdown.

Annex A
(normative)
Test results – Uncertainty of measurement

For each of the required measurements performed in accordance with this standard, a corresponding estimate of the uncertainty of measurement shall be evaluated. This estimate of uncertainty shall be applied and stated when reporting test results, in order to enable the user of the test report to assess the reliability of the data.