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Skyddshjälm – Provningsmetoder – Del 5: Hakbandets hållfasthet

Protective helmets – Test methods – Part 5: Retention system strength

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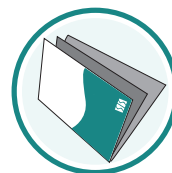
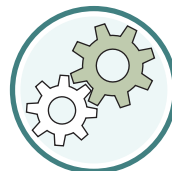
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Denna standard ersätter SS-EN 13087-5, utgåva 1.

The European Standard EN 13087-5:2012 has the status of a Swedish Standard. This document contains the official version of EN 13087-5:2012.

This standard supersedes the Swedish Standard SS-EN 13087-5, edition 1.

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EUROPEAN STANDARD

EN 13087-5

NORME EUROPÉENNE

EUROPÄISCHE NORM

February 2012

ICS 13.340.20

Supersedes EN 13087-5:2000

English Version

Protective helmets - Test methods - Part 5: Retention system strength

Casques de protection - Méthodes d'essai - Partie 5:
Résistance du système de rétention

Schutzhelme - Prüfverfahren - Teil 5: Festigkeit des
Haltesystems

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

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.

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Foreword

This document (EN 13087-5:2012) 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 13087-5:2000.

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.

This European Standard consists of the following ten parts:

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 rigidity¹;

Part 10 : Resistance to radiant heat.

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.

¹ To be published.

Introduction

This European 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 specifies 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 the method of test for retention system strength.

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*

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

3 Terms and definitions

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

4 Prerequisites

In order to implement this part of EN 13087, 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 of test - 5.2 (including 5.2.3.1 or 5.2.3.2), 5.3 or 5.4, and the initial and intermediate forces;
- g) sizes of the headforms;
- h) impact energy, including tolerance, of the falling mass - methods 5.3 and 5.4;
- i) fitting instructions.

5 Methods

5.1 General

Testing shall be performed in ambient conditions specified in EN 13087-1.

Three test methods are specified. The method to be used is specified in the helmet standard.

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5.2 Headform support, increasing load method

5.2.1 Principle

The helmet is supported on a headform and a specified, varying force is applied to the retention system via an artificial jaw. In method (a) (see 5.2.3.1) the ultimate tensile strength of the system alone is measured. In method (b) (see 5.2.3.2) the elongation of the system is measured as well.

5.2.2 Apparatus

5.2.2.1 General

The apparatus shall include:

- a series of headforms;
- a rigid structure to support the headforms;
- an artificial jaw;
- a means of applying a variable tensile force to the artificial jaw;
- a means to measure the displacement of the artificial jaw.

An arrangement of a suitable apparatus is shown in Figure 1.

5.2.2.2 Test headforms

Headforms, conforming to EN 960:2006, 2.2, 3.1.2 and 3.2. The sizes to be used are specified in the helmet standard, but shall be selected from size designations 495, 535, 575, 605 and 625 (equivalent to codes A, E, J, M and O, respectively, EN 960:1994).

5.2.2.3 Rigid structure

Rigid structure, capable of supporting the headform so that it does not move during the test.

5.2.2.4 Artificial jaw

Artificial jaw, comprising two rigid cylindrical rollers of diameter $(12,5 \pm 0,5)$ mm, with their longitudinal axes separated by (75 ± 2) mm.

5.2.2.5 Means of applying a known variable force to the artificial jaw

Any suitable means may be used.

5.2.2.6 Means to measure the displacement of the artificial jaw

Any suitable means may be used.

5.2.3 Procedure

5.2.3.1 Method (a)

Mount the helmet on the appropriate headform, pass the chinstrap through and secure it around the artificial jaw.

Apply the initial tensile force as specified in the appropriate helmet standard to the artificial jaw. Increase the force at a rate of (20 ± 2) N/min until the artificial jaw is released due to failure of the retention system.

Record the maximum force measured during the test and the mode of failure of the retention system.

5.2.3.2 Method (b)

Mount the helmet on the appropriate headform, pass the chinstrap through and secure it around the artificial jaw.

Apply the initial tensile force as specified in the appropriate helmet standard in order to ensure that the fastening device is correctly tightened. Note the position, P_0 , of the load bearing spindle to the nearest millimetre.

Increase the force over a period of (30 ± 3) s up to the intermediate force specified in the appropriate helmet standard. Maintain this force for (120 ± 3) s, then note the position, P_1 , of the load bearing spindle to the nearest millimetre, and, if required by the appropriate helmet standard, re-measure the width of the chinstrap.

Increase the force at a rate of (500 ± 50) N/min until the artificial jaw is released due to failure of the retention system. Record the maximum force measured during the test and the mode of failure of the retention system.

5.2.4 Test report

Method (a)

Report the maximum force measured during the test and the mode of failure of the retention system.

Method (b)

Calculate and report the elongation of the retention system as the difference between positions P_0 and P_1 .

Report the maximum force measured during the test and the mode of failure of the retention system, and, if required, the width of the chinstrap.

5.3 Hook support, dynamic load method

5.3.1 Principle

The helmet, including retention system, is fitted to a headform which is then subjected to a sudden downward force. The maximum and residual displacements of the headform are measured.

5.3.2 Apparatus

5.3.2.1 General

The apparatus shall include:

- a series of headforms;
- a helmet support hook assembly;