SLOVENSKI STANDARD
SIST EN 13087-10:2001

01-april-2001

Varovalne čelade - Preskusne metode - 10. del: Odpornost proti toplotnemu sevanju

Protective helmets - Test methods - Part 10: Resistance to radiant heat

Schutzhelme - Prüfverfahren - Teil 10: Beständigkeit gegen Strahlungswärme

Casques de protection - Méthodes d'essai - Partie 10: Résistance à la chaleur radiante

Ta slovenski standard je istoveten z: **EN 13087-10:2000**

ICS:

13.340.20 Varovalna oprema za glavo Head protective equipment

SIST EN 13087-10:2001 **en**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 13087-10

October 2000

ICS 13.340.20

English version

Protective helmets - Test methods - Part 10: Resistance to radiant heat

Casques de protection - Méthodes d'essai - Partie 10: Résistance à la chaleur radiante

Schutzhelme - Prüfverfahren - Teil 10: Beständigkeit gegen Strahlungswärme

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.

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.

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

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

Ref. No. EN 13087-10:2000 E

CONTENTS

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of an identical text or by endorsement, at the latest by April 2001, and conflicting national standards shall be withdrawn at the latest by April 2001.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 method of test for resistance to radiant heat.

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 960 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 European Standard, the terms and definitions given in this 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) the heat flux intensity to be used
g) fitting instructions

5 Methods

5.1 General

Testing shall be performed in ambient conditions specified in EN 13087-1.
The intensity to be used is specified in the helmet standard.

5.2 Principle

Heat radiation of a known intensity from an infra-red source is allowed to fall onto the outer surface of a helmet mounted on an instrumented headform . The temperature of the headform surface is measured.

5.3 Apparatus

5.3.1 General

The apparatus shall include:-

- a heater
- a calibrated radiometer/calorimeter
- a test headform
- a set of temperature sensing elements and temperature indicator

The principle of a suitable apparatus is shown in Figure 1.

5.3.2 Heater

A heater is mounted with its radiating surface horizontal and facing downwards. The radiating surface shall be flat with dimensions (250 ±5) mm by (250 ±5) mm.

The peak wavelength of the emitted heat radiation shall be between 2 μm and 3 μm. The intensity of radiation shall be uniform and shall be adjustable.

5.3.3 Calibrated calorimeter/radiometer

A calibrated (see notes) calorimeter/radiometer is mounted with its sensing surface horizontal and facing upwards. It is free to move horizontally so that the centre of its sensing surface can be brought centrally underneath the heater.

NOTE 1 The test equipment should be located away from surfaces which reflect the radiant heat which may fall on them or allow passage of measurable quantities of heat into the test equipment area.

NOTE 2 The effects of draughts should be minimized

5.3.4 Headform

A headform, constructed of hardwood or of any material with an equivalent thermal conductivity and complying with EN 960, shall be mounted on a movable and adjustable device.

The test site shall be as specified in the helmet standard, corresponding to a nominal 30° lateral inclination of the headform relative to the vertical.

NOTE All supports for headform and radiometer/calorimeter should be of low heat conductivity and reflectivity.

5.3.5 Temperature sensing elements

Three calibrated (see notes) temperature sensing elements (each preferably consisting of a thermocouple mounted on a circular copper disc of (7 ±1) mm diameter) are secured by electrically insulating adhesive to the headform surface on the side to be exposed to the heat.

Their centres shall lie within 5 mm of the points defined by the intersection of a transverse vertical plane passing through the test site and:

a) the central vertical axis

b) the AA' plane (as defined in EN 960)

c) midway between position a) and b) measured along the headform surface.

NOTE Suitable ISO or CEN standards should be selected, when available, for these calibration requirements.

5.4 Procedure

5.4.1 Mount the helmet on the headform in the manner it is intended to be worn on the head, with the test site lying centrally beneath the heater and measure the distance, d (see Figure 1) from the radiating surface. Record the temperatures on the headform

5.4.2 Move the helmeted headform aside to allow setting of the radiant heat intensity.

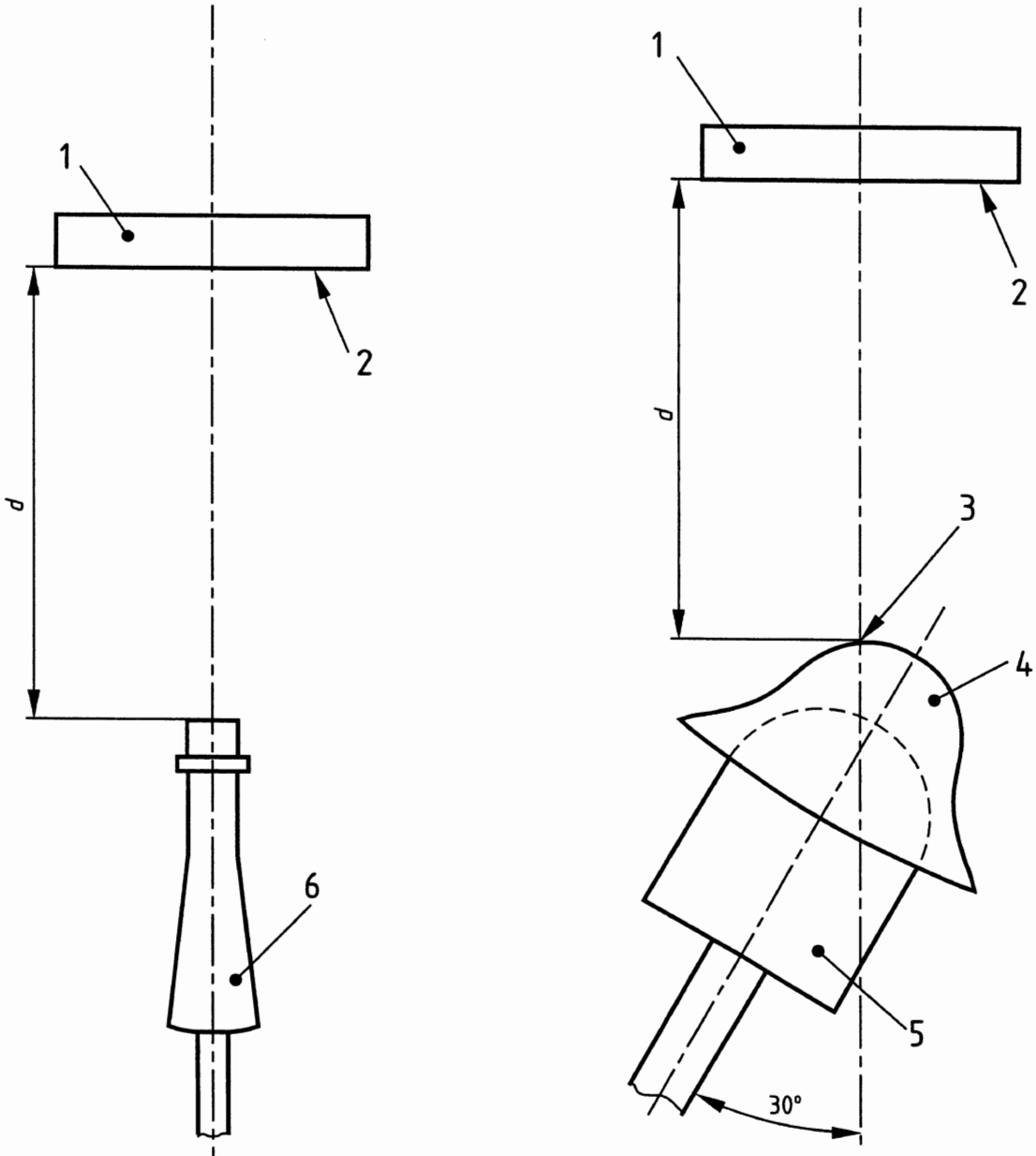
5.4.3 Move the radiometer/calorimeter centrally beneath the heater and adjust the distance, d (see Figure 1) from the radiating surface to correspond with that measured in 5.4.1. Adjust the heater controls until the heat flux intensity measured is as specified in the appropriate helmet standard. Remove the radiometer/calorimeter.

5.4.4 Replace the helmeted headform in the position determined in 5.4.1 and expose the helmet to the radiant heat for (180 ±2) s. At the end of this period, record the temperatures on the headform.

5.4.5 Switch off the heater and remove the helmet. Allow the helmet to cool to ambient temperature for at least 4 h before performing any further tests.

5.5 Report

Report the maximum difference between the temperatures measured in 5.4.1 and 5.4.4.



Key
1 Heater
2 Radiating surface
3 Test site
4 Helmet
5 Headform
6 Radiometer/Calorimeter

(a) Measuring the radiant heat (5.4.3)

(b) Test set-up

Figure 1 - Schematic drawing for the radiant heat test