

Headforms for use in the testing of protective helmets

The European Standard EN 960 : 1994 has the status of a
British Standard

ICS 13.340.20

Committees responsible for this British Standard

The preparation of this British Standard was entrusted to Technical Committee PSM/10, Vehicle users helmets, upon which the following bodies were represented:

- Auto-cycle Union
- British Medical Association
- British Motorcyclists' Federation
- Consumer Policy Committee of BSI
- Department of Transport
- Industrial Safety (Protective Equipment) Manufacturers' Association
- Institute of Trading Standards Administration
- Metropolitan Police
- Ministry of Defence
- Motor Cycle Industry's Association of Great Britain Ltd.
- Royal Automobile Club
- Snell Memorial Foundation UK

This British Standard, having been prepared under the direction of the Health and Environment Sector Board, was published under the authority of the Standards Board and comes into effect on 15 July 1995

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Amendments issued since publication

Amd. No.	Date	Text affected
9998	May 1998	Indicated by a sideline in the margin

The following BSI references relate to the work on this standard:
Committee reference PSM/10
Draft for comment 93/302235 DC

ISBN 0 580 23431 2

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National foreword

This British Standard has been prepared under the direction of the Consumer Products and Services Sector Board and is the English language version of EN 960 : 1994 *Headforms for use in the testing of protective helmets*, including Amendment A1 : 1998, published by the European Committee for Standardization (CEN). It supersedes BS 6489 : 1984, which is withdrawn.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, the EN title page, pages 2 to 20, an inside back cover and a back cover.

ICS 13.340.00

Descriptors: Safety, accident, prevention, helmets, test dummies, tests, dimensions, codes, tables (data), marking

English version

Headforms for use in the testing of protective helmets

(includes amendment A1 : 1998)

Fausses têtes à utiliser lors des essais de casques
de protection (inclut l'amendement A1 : 1998)

Prüfköpfe zur Prüfung von Schutzhelmen
(enthält Änderung A1 : 1998)

This European Standard was approved by CEN on 1994-12-07. 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, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

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

Foreword

This European Standard has been prepared by the Technical Committee CEN/TC 158, Head protection, the secretariat of which is held by BSI.

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 EC Directive(s).

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 June 1995, and conflicting national standards shall be withdrawn at the latest by June 1995.

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

Foreword to amendment A1

This Amendment EN 960 : 1994/A1 : 1998 to EN 960 : 1994 has been prepared by Technical Committee CEN/TC 158, Head protection, the secretariat of which is held by BSI.

This Amendment to the European Standard EN 960 : 1994 shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by August 1998, and conflicting national standards shall be withdrawn at the latest by August 1998.

This Amendment to the European Standard EN 960 : 1994 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).

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, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

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1 Scope

This European Standard specifies the sizing and constructional details of headforms for use in the testing of protective helmets.

A recommended method of constructing wooden headforms is given in the annex.

2 Materials

2.1 Headforms for shock absorption and penetration tests with falling headform/helmet assembly

The headforms shall be made of a metal having a low resonance frequency but not below 3000 Hz.

NOTE. A material with the following composition has been found suitable:

magnesium/zirconium binary alloy with 0,3 % to 0,8 % zirconium, $d = 1,79 \text{ kg/dm}^3 \pm 0,01 \text{ kg/dm}^3$.

Examples of designations:

France: Maxium II;

United Kingdom: Alloy ZA;

USA: Alloy KIA.

2.2 Headforms for shock absorption and penetration tests with fixed headform/helmet assembly

The headforms shall be made of a rigid material which does not interfere with the measurements (e.g. wood as described in the annex).

2.3 Headforms for geometric examination or positional marking

Any suitable material.

2.4 Headforms for other tests

Where a test requires specific characteristics of the material (e.g. thermal or electrical conductivity or thermal capacity), these characteristics shall be specified in the appropriate standard.

3 General characteristics

Headforms according to 2.1 shall have the following general characteristics.

Code letter	Inside circumference of helmet mm	Mass kg
A	500	$3,1 \pm 0,10$
E	540	$4,1 \pm 0,12$
J	570	$4,7 \pm 0,14$
M	600	$5,6 \pm 0,16$
O	620	$6,1 \pm 0,18$

The centre of gravity of the headforms shall be near point G on the central vertical axis z mm below the reference plane (see figure 3 and table 3). Near its centre of gravity the headform shall contain a housing for a tridirectional accelerometer.

4 Sizing

4.1 Size codes

The size codes used for headforms, related to the inside circumference of helmets and other measurements are listed in table 1. The circumference values refer to the internal circumference of the helmet measured at the headband level (AA') as illustrated in figure 1.

4.2 Basic data

The headform coordinate references are given in figures 2 and 3. Each datum level is quoted relative to the reference plane.

4.3 Dimensions

4.3.1 Above the reference plane

The headforms shall comply with the appropriate dimensions given in table 2. The polar coordinates of the horizontal half-sections at each datum level referred to in table 2 are illustrated in figure 2.

4.3.2 Below the reference plane

The headforms shall comply with the appropriate dimensions given in table 3. The polar coordinates referred to in this table are illustrated in figures 3a to 3c.

5 Marking

All headforms shall be marked with:

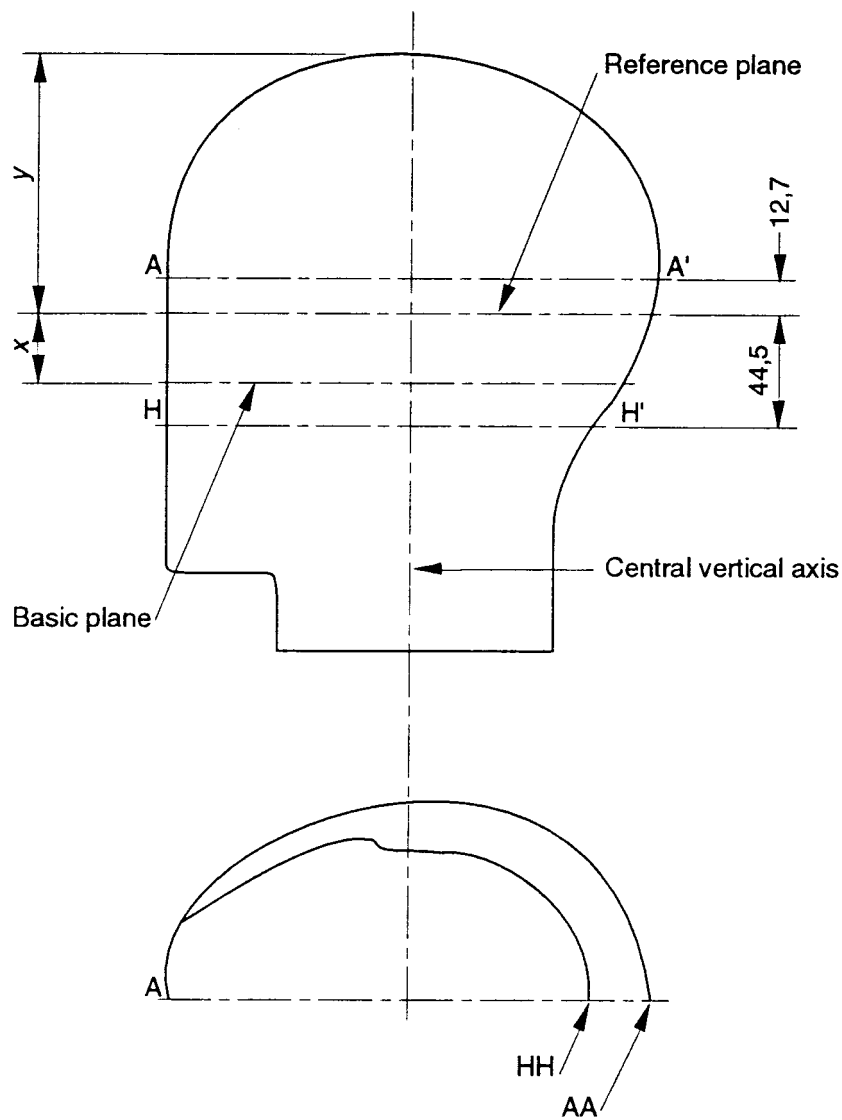
- the basic plane as illustrated in figure 2;
- the longitudinal and transverse planes through the vertical axis;
- the size code of the headform.

NOTE. Other marking may be required by specific product standards.

Table 1. Measurements for headform sizes related to figure 1

Dimensions in millimetres			
Code letter	Inside circumference of helmet	y	x
A	500	89,7	24,0
B	510	91,2	24,5
C	520	93,0	25,0
D	530	94,5	25,5
E	540	96,0	26,0
F	550	97,5	26,5
G	560	99,0	27,0
J	570	102,5	27,5
K	580	104,0	28,0
L	590	105,4	28,5
M	600	107,0	29,0
N	610	108,7	29,5
O	620	110,0	30,0
P	630	111,8	30,5
Q	640	113,5	31,0

Tolerance on each dimension other than the inside circumference of the helmets: $\pm 0,25 \text{ mm}$



Dimensions in millimetres
Figure 1. Principal planes of a headform