



**SLOVENSKI STANDARD**  
**SIST EN 960:1996**  
**01-december-1996**

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**Modeli glav za preskušanje zaščitnih čelad**

Headforms for use in the testing of protective helmets

Prüfköpfe zur Prüfung von Schutzhelmen

Faussees tetes a utiliser lors des essais de casques de protection

**Ta slovenski standard je istoveten z: EN 960:1994**

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**ICS:**

13.340.20 Varovalna oprema za glavo Head protective equipment

**SIST EN 960:1996**

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EUROPEAN STANDARD

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English version

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Fausses têtes à utiliser lors des essais de casques de protection

Prüfköpfe zur Prüfung von Schutzhelmen

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# CEN

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

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

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## 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).

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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of an identical text or by endorsement, at the latest by June 1995, and conflicting national standards shall be withdrawn at the latest by June 1995.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, United Kingdom.

## 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 per cent Zirconium  
d-1,79 kg/dm<sup>3</sup> ± 0,01 kg/dm<sup>3</sup>

Examples of designations:

France: Maxium II  
United Kingdom: Alloy ZA  
USA: Alloy K1A

### 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 ± 0,10
E	540	4,1 ± 0,12
J	570	4,7 ± 0,14
H	600	5,6 ± 0,16
O	620	6,1 ± 0,18

The centre of gravity of the headforms shall be near point G on the central vertical axis 2 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 co-ordinate 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 co-ordinates 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 co-ordinates referred to in this table are illustrated in figures 3 a) to 3 c).

## 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

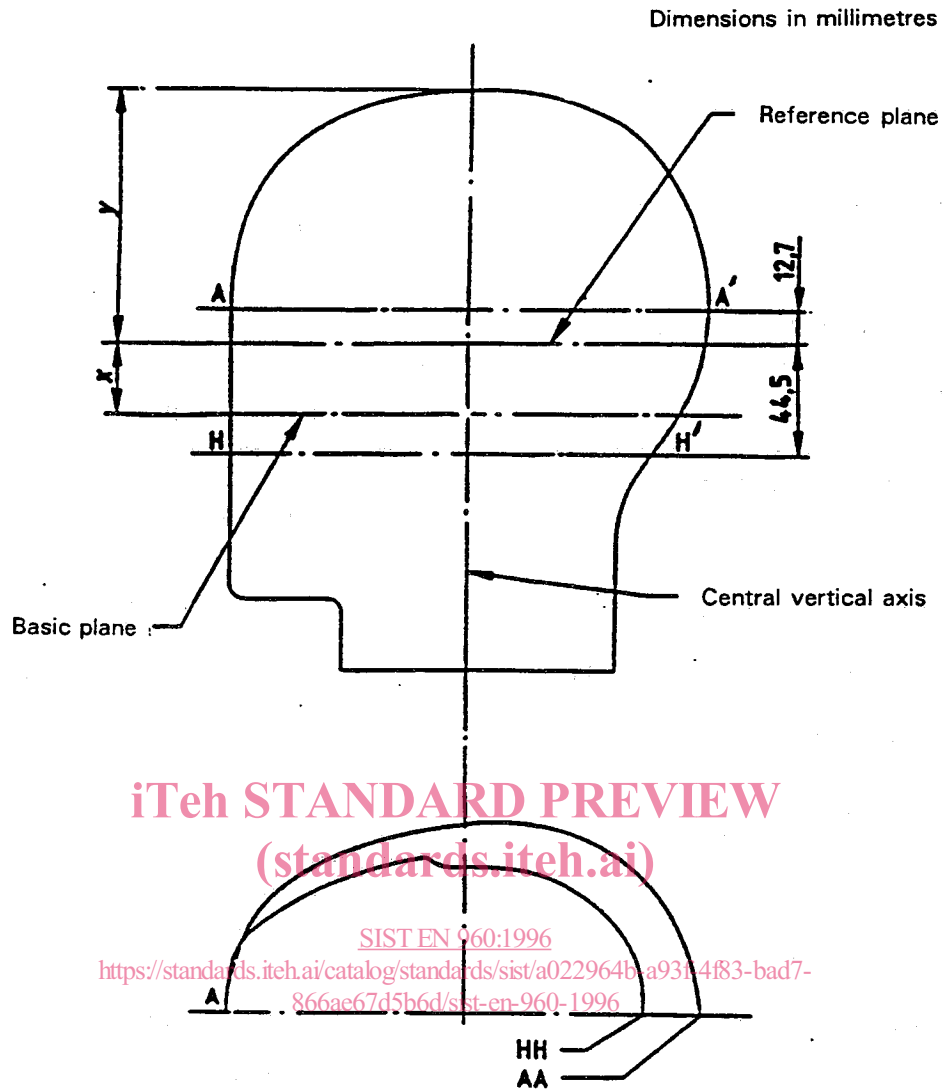


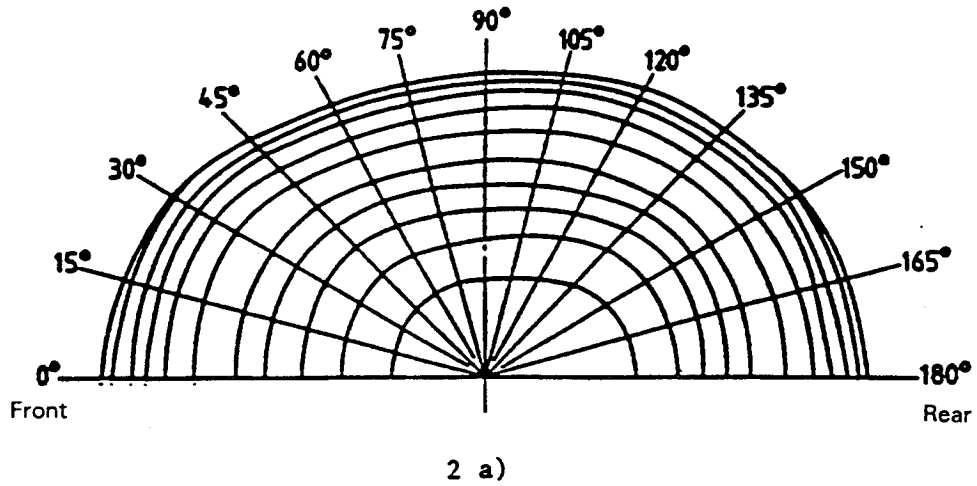
Figure 1: Principal planes of a headform

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:  $\pm 0,25$  mm



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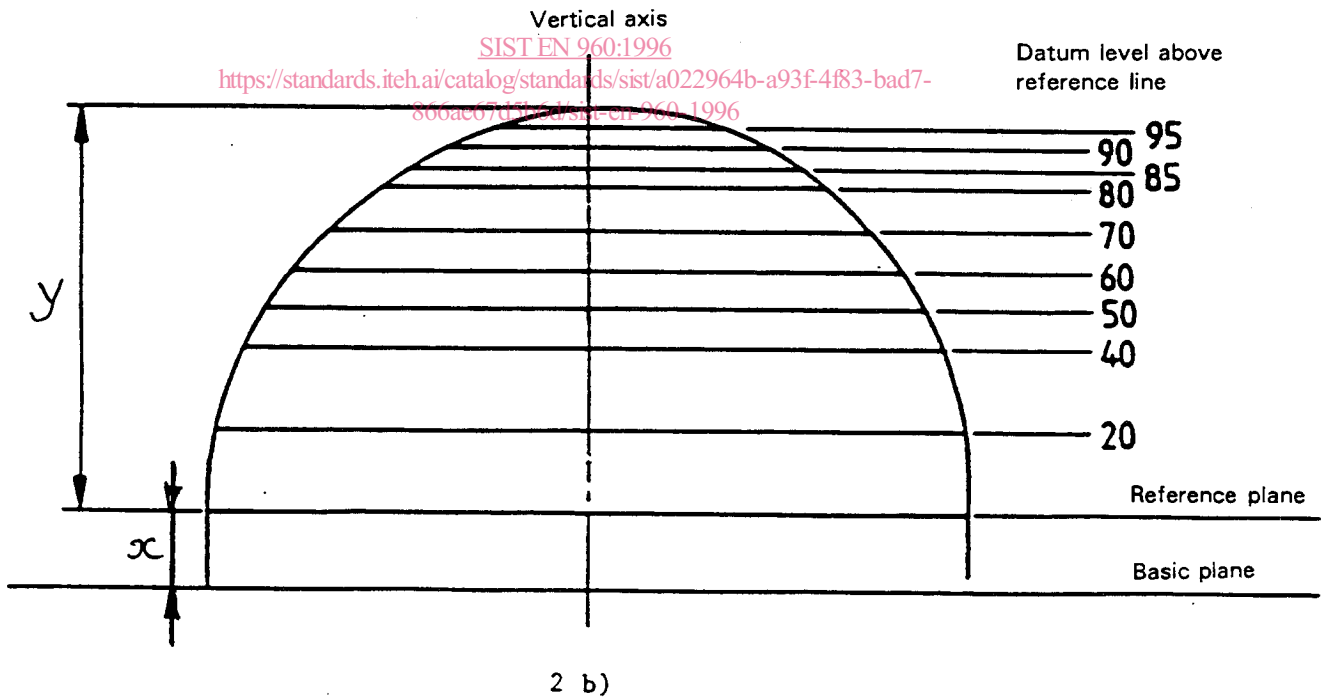


Figure 2: Headform basic data above basic plane

Table 2 - Polar co-ordinates of horizontal half-sections  
above the reference plane

Dimensions in millimetres

2 - A													
Height above reference plane	0°	15°	30°	45°	60°	75°	90°	105°	120°	135°	150°	165°	180°
	Front												Back
0	88,0	86,5	83,0	75,5	70,0	67,0	66,5	69,5	73,5	78,5	84,0	87,0	88,0
20	85,5	84,5	82,5	75,5	70,0	67,0	66,5	69,5	73,5	78,5	84,0	87,0	87,0
40	80,0	79,5	79,0	72,0	67,5	65,0	64,5	67,0	71,0	76,0	80,5	82,0	81,5
50	75,0	75,0	74,5	68,5	63,5	61,0	60,5	63,5	67,0	72,0	76,0	77,0	77,0
60	68,0	68,0	67,5	62,5	57,5	55,5	55,0	58,0	61,5	66,0	70,0	70,0	70,5
70	56,0	56,0	55,5	53,0	49,5	47,0	47,0	49,0	53,0	57,0	61,5	61,0	61,0
80	37,0	37,0	37,0	36,5	35,5	34,0	34,0	36,0	39,5	44,5	49,0	49,0	48,5
85	23,0	23,0	23,0	22,0	22,0	23,0	24,0	24,5	29,5	33,5	36,0	36,5	37,0

Dimension y : 89,7 mm

Measurement round head: 500 mm

2 - B													
Height above reference plane	0°	15°	30°	45°	60°	75°	90°	105°	120°	135°	150°	165°	180°
	Front												Back
0	89,5	88,0	84,5	76,5	74,5	68,5	68,0	71,0	75,0	80,5	86,0	89,0	89,5
20	87,0	86,5	83,5	76,5	71,5	68,5	68,0	71,0	75,0	80,5	86,0	88,0	89,0
40	81,5	81,5	80,0	74,0	69,0	66,0	65,5	66,0	72,0	77,0	77,5	83,0	83,5
50	77,0	77,0	76,0	70,0	65,5	63,0	62,5	65,0	68,5	73,5	77,5	78,5	78,5
60	69,5	70,0	70,0	64,0	59,0	57,0	57,5	59,5	62,5	67,5	72,0	72,0	72,0
70	59,5	58,5	59,0	54,0	50,0	48,0	48,0	50,5	54,0	59,0	63,5	64,0	63,5
80	41,5	42,0	42,0	39,0	37,5	37,0	37,0	39,0	42,0	47,0	51,5	51,5	51,0
85	28,0	28,5	29,0	28,0	26,5	27,0	27,5	29,0	32,5	37,0	41,5	41,0	41,5
90	7,0	6,5	7,0	7,5	8,0	9,5	11,5	13,5	17,0	19,5	23,0	22,5	21,0

Dimension y : 91,2 mm

Measurement round head: 510 mm

2 - C													
Height above reference plane	0°	15°	30°	45°	60°	75°	90°	105°	120°	135°	150°	165°	180°
	Front												Back
0	91,5	89,5	86,0	79,0	72,5	70,0	69,5	72,5	77,0	82,0	87,5	90,5	91,5
20	90,0	88,0	85,5	79,0	72,5	70,0	69,5	72,5	77,0	82,0	87,0	90,0	90,5
40	84,5	83,0	82,0	76,0	70,0	68,0	68,0	70,5	74,5	79,5	83,5	85,5	86,5
50	79,5	78,5	77,5	72,5	67,0	64,5	64,5	67,0	71,0	76,0	79,5	81,0	81,5
60	72,5	72,0	71,0	67,0	62,0	59,5	59,5	62,0	66,0	71,0	74,0	75,0	75,0
70	62,0	62,0	61,5	58,0	54,0	52,0	52,0	54,5	58,5	63,0	66,0	66,5	66,5
80	46,0	46,0	45,5	43,5	42,0	40,5	41,0	43,0	46,5	51,0	54,5	55,0	55,0
85	35,5	35,5	35,0	33,5	32,5	32,0	32,5	34,5	38,0	42,0	44,5	45,5	45,5
90	20,0	20,0	19,5	19,0	18,5	18,5	19,5	21,0	24,0	28,0	30,0	30,5	30,5

Dimension y : 93 mm

Measurement round head: 520 mm



Table 2 (continued)

2 - D													
Height above reference plane	0°	15°	30°	45°	60°	75°	90°	105°	120°	135°	150°	165°	180°
	Front												Back
0	93,0	91,0	88,0	81,0	74,5	71,5	71,0	74,0	78,0	84,0	89,5	92,0	93,0
20	91,0	89,5	87,0	81,0	74,5	71,5	71,0	74,0	78,0	84,0	89,5	92,0	92,5
40	85,0	85,0	83,5	77,5	72,0	68,5	69,0	71,0	75,0	80,5	86,0	87,0	87,5
50	81,0	80,5	80,0	74,0	69,0	66,0	66,0	69,0	72,0	77,5	82,5	83,0	83,5
60	75,0	75,0	74,0	68,0	63,5	61,0	61,0	63,5	67,5	72,0	76,0	77,0	77,5
70	64,5	64,5	64,5	60,0	55,5	53,0	53,5	56,0	60,0	64,5	68,0	68,5	69,0
80	48,5	48,5	48,5	47,0	44,5	43,0	43,0	45,0	48,5	53,5	57,5	58,0	58,0
85	39,0	39,0	39,0	37,0	37,0	36,0	36,0	38,0	41,0	45,5	48,5	49,0	49,0
90	23,0	23,0	23,0	24,0	24,5	25,0	25,0	27,0	30,0	33,0	37,0	37,0	37,0

Dimension y : 94,5 mm Measurement round head: 530 mm

2 - E													
Height above reference plane	0°	15°	30°	45°	60°	75°	90°	105°	120°	135°	150°	165°	180°
	Front												Back
0	94,5	93,0	90,0	82,0	76,5	73,5	73,0	76,0	80,0	85,0	91,0	94,0	94,5
20	92,5	91,5	89,0	82,0	76,5	73,5	73,0	76,0	80,0	85,0	90,5	93,5	94,0
40	87,0	87,5	85,0	79,5	74,5	71,0	71,5	74,0	77,5	82,5	88,0	89,0	89,0
50	82,5	83,0	81,0	76,0	71,0	68,0	68,0	70,5	74,0	79,5	83,5	84,5	84,5
60	76,5	76,5	75,5	71,0	66,5	63,5	63,5	66,0	69,5	74,0	78,5	79,0	79,0
70	66,5	66,5	66,5	63,0	59,0	56,5	56,5	58,5	62,0	66,5	70,5	71,0	71,0
80	52,0	52,0	52,0	50,0	47,5	46,0	46,5	48,0	51,0	56,0	59,5	60,0	60,0
85	41,5	41,5	41,5	40,5	39,5	39,0	39,5	41,0	44,0	48,0	51,5	52,0	52,0
90	28,0	28,0	28,5	28,5	28,5	29,0	30,0	31,0	34,0	37,5	41,5	42,0	42,0
95	10,0	10,0	10,0	10,0	10,0	10,5	11,0	12,0	13,5	15,0	16,0	16,0	16,0

Dimension y : 96 mm Measurement round head: 540 mm

2 - F													
Height above reference plane	0°	15°	30°	45°	60°	75°	90°	105°	120°	135°	150°	165°	180°
	Front												Back
0	96,0	94,5	91,0	83,5	78,0	74,5	74,5	77,0	81,0	86,5	92,0	95,0	96,0
20	93,5	93,0	90,5	83,5	78,0	74,5	74,5	77,0	81,0	86,5	92,0	94,5	95,0
40	89,0	89,0	87,5	81,5	76,0	72,5	72,5	75,0	79,0	83,5	89,0	89,5	90,5
50	85,0	85,0	84,0	78,0	72,5	70,0	70,0	72,0	75,0	80,0	85,0	85,5	89,0
60	78,5	78,5	78,0	72,5	67,5	65,0	65,5	67,5	70,5	75,0	79,0	80,0	80,5
70	69,0	68,5	68,5	64,5	60,0	59,0	58,0	60,0	64,0	67,5	72,0	72,5	73,5
80	54,0	54,5	54,5	52,5	50,5	48,5	48,0	50,0	53,0	57,5	62,5	62,0	62,0
85	44,0	44,5	44,0	44,0	43,0	41,5	41,5	43,5	46,5	51,0	55,5	55,0	55,0
90	31,5	31,0	31,0	31,5	32,0	33,5	34,0	35,5	38,5	43,0	46,0	46,5	47,0
95	17,5	16,5	17,0	17,5	18,5	20,5	21,0	24,5	27,0	30,0	33,0	33,0	33,0

Dimension y : 97,5 mm Measurement round head: 550 mm