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Pohištvo - Stoli in mize za vzgojno-izobraževalne ustanove - 1. del: Funkcionalne mere

Furniture - Chairs and tables for educational institutions - Part 1: Functional dimensions

Möbel - Stühle und Tische für Bildungseinrichtungen - Teil 1: Funktionsmaße

Meubles - Chaises et tables pour les établissements d'enseignement - Partie 1: Dimensions fonctionnelles

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ICS:

97.140

Pohištvo

Furniture

SIST EN 1729-1:2016

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

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English Version

**Furniture - Chairs and tables for educational institutions -
Part 1: Functional dimensions**

Ameublement - Sièges et tables pour établissements
d'enseignement - Partie 1 : Dimensions fonctionnelles

Möbel - Stühle und Tische für Bildungseinrichtungen -
Teil 1: Funktionsmaße

This European Standard was approved by CEN on 3 October 2015.

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

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

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European foreword

This document (EN 1729-1:2015) has been prepared by Technical Committee CEN/TC 207 “Furniture”, the secretariat of which is held by UNI.

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of an identical text or by endorsement, at the latest by June 2016 and conflicting national standards shall be withdrawn at the latest by June 2016.

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 1729-1:2006.

Compared to EN 1729-1:2006, the following modifications have been made:

- a) addition of an annex for functional dimensions of tall chairs (Annex D);
- b) addition of an annex for functional dimensions of stools and associated worksurfaces (Annex E);
- c) key dimensions of chairs in Annexes A and D are measured using the school chair measuring device (see Annex F), some of them when the chair is loaded with specified loads;
- d) a rationale for the functional dimensions of chairs and tables is provided (Annex I).

EN 1729 is composed of the following parts:

- *Part 1: Functional dimensions* [the present document];
- *Part 2: Safety requirements and test methods.*

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, Former Yugoslav Republic of Macedonia, 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.

EN 1729-1:2015 (E)**Introduction**

This part of EN 1729 is based on the principle that chairs and tables, intended for use in educational institutions for general-purpose education, should be designed to encourage good postures.

This part of EN 1729 takes selected national standards into consideration.

It does not specify design, but only those dimensions which promote good posture for either fixed or adjustable furniture. The dimensional requirements of this European Standard permit various interpretations of design; hence customs, educational practices, technical and financial circumstances of individual countries can be satisfied. It includes a rationale for the determination of functional dimensions.

The minimum dimensions specified are considered as the absolute minimum. They can be exceeded. The maximum dimensions specified are considered as the absolute maximum; smaller dimensions can be used.

EN 1729-2 specifies safety requirements and test methods.

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1 Scope

This European Standard specifies functional dimensions and markings for all chairs, stools and tables, for educational institutions, including fixed and adjustable chairs and tables.

It applies to both un-upholstered and upholstered chairs and stools as well as to both non-swivel and swivel chairs. It applies to furniture for use with laptop computers or portable devices.

It does not apply to ranked seating or special purpose workstations.

It does not apply to furniture used by teaching personnel.

Annex A (normative) includes single-sloped chairs and associated tables.

Annex B (normative) includes double-sloped high chairs and associated tables.

Annex C (normative) includes standing-height tables.

Annex D (normative) includes tall chairs and associated tables.

Annex E (normative) includes stools and associated worksurfaces.

Annex F (normative) includes measurement methods.

Annex G (informative) includes guidance on size marks for adjustable chairs and tables.

Annex H (informative) includes guidance on calculating heights of double-sloped chairs and associated tables.

Annex I (informative) includes a rationale for functional dimensions.

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 1729-2, *Furniture - Chairs and tables for educational institutions - Part 2: Safety requirements and test methods*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1

median plane

vertical plane running from front to rear through the centre of the seat, dividing the chair into two equal parts

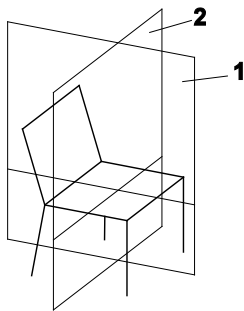
Note 1 to entry: See Figure 1.

3.2

transverse plane

vertical plane perpendicular to the median plane passing through the centre of the seat

Note 1 to entry: See Figure 1.



Key

- 1 median plane
- 2 transverse plane

Figure 1 — Illustration of the median and transverse planes

3.3

most forward point of the backrest (Point S)

most forward point in the specified range of the backrest on the median plane

Note 1 to entry: The specified range of the backrest is shown in Table F.2.

Note 2 to entry: See Figure A.3, Figure B.3 and Figure D.3.

3.4

adjustable furniture

furniture that can be adjusted by the users (pupils), without the need for tools

3.5

multi-size furniture

furniture that is adjustable at installation (not by the users) to change dimensions from one size mark to another

3.6

double-sloped seat

seat intended for sitting using either the front part of the seat (leaning forward) or the rear part of the seat (leaning backward), with the feet resting on a footrest or the floor

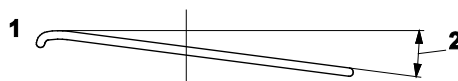
Note 1 to entry: See Figure 5 and Figure B.5.

3.7

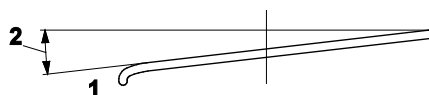
inclination of a single-sloped seat and of the front part of a double-sloped seat (α)

angle formed by the front part of the seat and the horizontal

Note 1 to entry: See Figure 2, Figure 3, Figure 4 and Figure 5.

**Key**

- 1 front
- 2 $\alpha < 0^\circ$ (negative for rearward-sloping seats)

Figure 2 — Example of a single-sloped seat with a negative seat angle**Key**

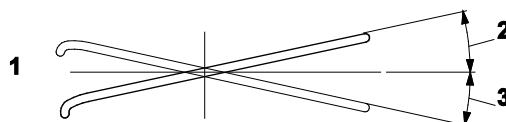
- 1 front
- 2 $\alpha > 0^\circ$ (positive for forward-sloping seats)

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Figure 3 — Example of a single-sloped seat with a positive seat angle

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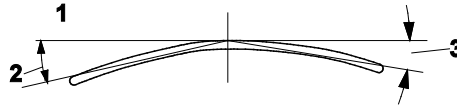
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**Key**

- 1 front
- 2 $\alpha > 0^\circ$
- 3 $\alpha < 0^\circ$

Figure 4 — Examples of a single-sloped tiltable seat

EN 1729-1:2015 (E)

**Key**

- 1 front
- 2 $\alpha > 0^\circ$
- 3 $\delta < 0^\circ$

Figure 5 — Example of a double-sloped seat (see Annex B)**3.8****inclination of the rear part of a double-sloped seat (δ)**

angle formed by the horizontal and the rear part of the seat, determined in the median plane

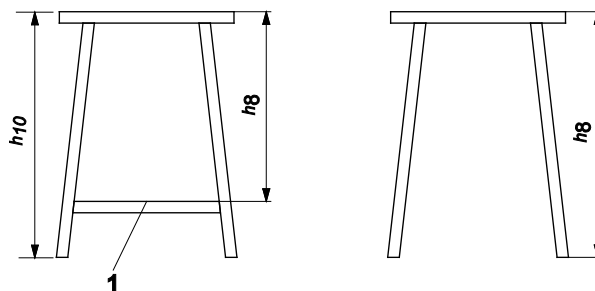
Note 1 to entry: See Figure 5.

3.9**stool**

seating without backrest or armrests and intended for use for short periods

Note 1 to entry: See Figure 6. The seat height to the footrest, h_8 , can be to one size mark and the seat height to the floor, h_{10} , can be to another size mark, as defined in Table E.1.

Note 2 to entry: Any upward extension at the back of the stool below the Point S range specified in Table F.2 cannot be considered to be a backrest and the seating can be considered to be a stool (see Figure E.3).

**Key**

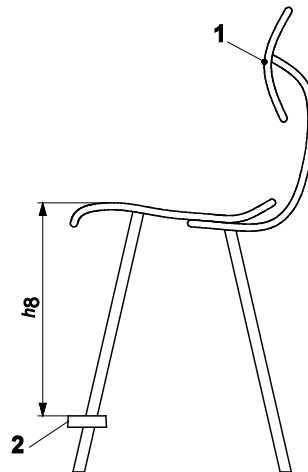
- 1 footrest
- h_8 seat height for stools as specified in Table E.1
- h_{10} total stool height

Figure 6 — Stools with and without footrest

3.10 tall chair

chair with the height of seat from the floor higher than the seat height specified in Table A.1 and with a footrest as shown in the figure below

Note 1 to entry: See Figure 7.



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Key

- 1 Point S [SIST EN 1729-1:2016](https://standards.iteh.ai/catalog/standards/sist/342b8a6b-616e-4cc2-9a31-4e556e446b93/sist-en-1729-1-2016)
 2 footrest <https://standards.iteh.ai/catalog/standards/sist/342b8a6b-616e-4cc2-9a31-4e556e446b93/sist-en-1729-1-2016>
 h_8 seat height for tall chair as specified in Table D.1

Figure 7 — Tall chair with footrest

3.11 school chair measuring device SCMD

measuring device intended for determining Point S, buttock zone and chair dimensions of school chairs

Note 1 to entry: Details of the SCMD and the method of use are given in Annex F.

4 Functional dimensions for chairs and tables

The functional dimensions and corresponding size marks and colour codes for chairs with slopes between -5° and $+7^\circ$ and associated tables shall be as specified in the normative Annex A.

The functional dimensions and corresponding size marks and colour codes for high chairs with double-sloped seats and associated tables shall be as specified in the normative Annex B.

The functional dimensions and corresponding size marks and colour codes for standing-height tables shall be as specified in normative Annex C.

The functional dimensions and corresponding size marks and colour codes for tall chairs shall be as specified in the normative Annex D. Tables suitable for tall chairs cannot be size marked. Tables shall correspond to the height of tall chairs as in Table D.2.

EN 1729-1:2015 (E)

The functional dimensions and corresponding size marks and colour codes for stools shall be as specified in the normative Annex E. Worksurfaces shall correspond to the height of stools as in Table E.3.

Adjustable and multi-size furniture shall fulfil the requirements specified in Annex A, Annex B, Annex C, Annex D or Annex E.

The stature and popliteal height ranges shown in Table A.1, Table A.2, Table B.1, Table B.2, Table C.1 and Table D.1 do not include any allowance for shoes. All chair and table heights include an allowance for shoes.

Assessment needs to be carried out according to EN 1729-1 before being tested according to EN 1729-2.

5 Marking

Chairs and tables in Annex A shall be marked as 0 to 7. Chairs and tables in Annex B shall be marked as B0 to B7. Standing-height tables in Annex C shall be marked as C0 to C7. Tall chairs in Annex D shall be marked as D0 to D7. Stools in Annex E shall be marked as E0 to E7.

The marking of fixed and adjustable chairs and tables shall be legible and indelible and shall include at least the following information:

- a) size mark or colour code or both, as specified in Annex A, Annex B, Annex C, Annex D or Annex E;
- b) marking on adjustable furniture of the size marks covered;
- c) name and/or trade name and/or mark and address of the manufacturer or his or her authorized representative in full or in abbreviated form provided the abbreviation enables the manufacturer and/or his or her authorized representative to be identified;
- d) date of production by stating at least the year and month of production.

Tall chairs shall also be marked with a reference where to find information on the table height they are intended to be used with. This information shall be provided on a label directly or via a web address, QR-code or other suitable application. Tables that are intended for use with tall chairs shall be marked with their height (distance from the floor to the top of the table). This information shall be provided on a label directly or via a web address, QR-code or other suitable application.

6 Instructions

The instructions shall be submitted with the furniture in the official languages(s) of the country where the furniture is sold. They can be given affixed to the furniture, on a label, in a leaflet or in the instructions for use. They shall include at least the following:

- a) **Size mark reference:** size mark identification shall be referenced to this European Standard;
- b) **Maintenance instructions:** including information on maintenance and cleaning;
- c) **Installation instructions for multi-size furniture:** instructions on how to adjust the furniture to fit a specific group of pupils;
- d) **Adjustability information:** instructions for the users (pupils) of adjustable furniture shall include information on how to operate the adjustments and information on how to recognize correct settings and therefore a good posture;
- e) **Warning concerning the hazard when working with gas lifts:** "Attention: Any repair or service work with gas cylinders shall be carried out by trained persons only."

If the height adjustment is continuous, there is no need to show each size mark explicitly. It is sufficient to have an indication showing the size marks it covers and to have a set of clear instructions, with drawings, on how to adjust the chair to achieve a good posture. This also applies to tables.

NOTE Appropriate drawings or pictures can be used to reinforce the information in instruction leaflets.

7 Approval of range

In order to approve a range of chairs, stools or tables, each size mark within the range shall be measured separately.

When assessing table top dimensions for a range of tables, if there are six or fewer different table top shapes or sizes in the range, all table tops shall be measured. If there are more than six different table top shapes or sizes, six shall be measured and the additional table top shapes or sizes shall be assessed from the manufacturer's drawings of them. The drawings shall show full details (dimensions) of each table top and its under frame structure. The information provided shall be used to assess whether the size of table top and legroom clearance fulfil the requirements of the standard.

The test report shall state which table tops have been measured and which have been assessed from drawings. These drawings shall be attached to the report.

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Annex A (normative)

Functional dimensions for chairs with slopes between -5° and $+7^\circ$ and associated tables

A.1 Functional dimensions and size marks for chairs

The dimensions, angles, size marks and colour codes for chairs shall be as given in Table A.1. Where dimensions are stated as ranges, the measured dimension shall be any value in this range.

All accessible edges shall be rounded or chamfered.

Room for free movement of the buttocks shall be ensured. If the backrest extends below Point S, it shall be angled rearwards such as to maintain the buttock zone as shown in Figure A.3.

Raised edges and surfaces shall not dig into thighs. This applies to points or edges on the seat surface or frame in front of the position indicated by the rear pins on the SCMD, outside the planes through the rear pins which are parallel to the median plane, as shown by the shaded area in Figure A.1. This requirement is fulfilled when these points are not higher than 15 mm above the lowest point on the seat surface in the planes through the rear pins and parallel to the median plane for size marks 0 to 3 and 25 mm above the lowest point for size marks 4 to 7.



a) Isometric view of seat pad

b) Cross-section of seat parallel to transverse plane

Key

- 1 position on the seat of the rear pins of the SCMD
- 2 raised edge or surface
- 3 horizontal bar
- 4 top surface of seat
- e height of raised edges or surfaces, ≤ 15 mm for size marks 0 to 3 and ≤ 25 mm for size marks 4 to 7

Figure A.1 — Dimensions of raised seat edges

Determination of functional dimensions

The determination of the functional dimensions of chairs is specified below. See also Figure A.2, Figure A.3, Figure A.4, Figure A.5 and Figure A.6. If the seat and/or backrest is adjustable or tiltable, the seat shall be set to horizontal or as close as possible to horizontal and the backrest shall be set to vertical or as close as possible to vertical. If the SCMD is used, these shall be set after the SCMD is placed on the chair, and if a load is placed on the SCMD these shall be set after loading.

(h₈) The height of the seat is the vertical distance between the highest point on the front of the seat, as determined by the SCMD, and the ground. See Figure A.5 and Figure A.6.

(t₄) The effective depth of the seat is the horizontal distance from Point S along the median plane to the front edge of the seat, the position of which shall be determined by the front edge indicator pins of the SCMD. See Figure A.5 and Figure A.6.

(b₃) The width of the seat shall be determined as the horizontal distance between vertical lines through the side edges of the seat surface at a distance from the front of the seat equal to half of t₄. See Figure A.2. The width of the seat shall include the frame where it is a continuation or integral part of the seat surface.

(h₇) The height of the backrest is the vertical distance between the top and the bottom of the backrest, determined on the median plane. See Figures A.5 and A.6.

(b₄) The width of the backrest is the greatest horizontal distance between its side edges in the Point S range as specified in Table F.2. The width of the backrest shall include the frame where it is a continuation or integral part of the backrest. See Figure A.2.

(r₂) The horizontal radius of the backrest shall be determined on the horizontal plane, at the same height as Point S. See Figure A.2. (standards.iteh.ai)

(α) The inclination of a single-sloped seat is the angle between the seat and the horizontal as determined by the SCMD on the chair. It is the angle between the horizontal and the top of the SCMD base plate under load. See Annex F and Figure 2, Figure 3, Figure 4 and Figure F.1.

(γ) The angle between the seat and the backrest shall be determined by the SCMD on the chair under load. On the SCMD, it is the angle between the vertical arm when it is inclined at the angle of the backrest and the top of the base plate. See Annex F and Figure F.1, Figure A.5 and Figure A.6.

(o) The width of the armrest is the minimum distance between the sides of the armrest/armrest pad, measured at 5 mm below the top surface of the armrest. See Figure A.4.

(p) The height of the armrest above the seat shall be determined by the SCMD on the chair. On the SCMD, it is the vertical distance between the top of the armrests and the bottom of the rear pins of the SCMD. See Annex F and Figure F.1 and Figure A.4.

(q) The distance from the backrest to the front of the armrest is the maximum horizontal distance between Point S and the front of the top of the armrest, the position of which is determined by the SCMD. See Figure A.4.

(r) The width between the armrests is the minimum horizontal distance between the armrests/armrest pads. See Figure A.4.

(n) The length of the armrest is the greatest length in the fore and aft direction of the armrest horizontally within 20 mm below the highest point. See Figure A.4.

(x) The distance between Point S and the back of the seat pad is the horizontal distance on the median plane between the rear edge of the seat and the vertical projection of Point S. It shall be determined only if the back of the seat pad does not extend behind Point S. See Figure A.5 and Figure A.6.