

BS EN 527-1:2011



BSI Standards Publication

Office furniture — Work tables and desks

Part 1: Dimensions

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National foreword

This British Standard is the UK implementation of EN 527-1:2011. It supersedes BS EN 527-1:2000 which is withdrawn.

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Foreword

This document (EN 527-1:2011) 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of an identical text or by endorsement, at the latest by November 2011, and conflicting national standards shall be withdrawn at the latest by November 2011.

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Introduction

Various designs of furniture for general office use exist as a consequence of rapid technological evolutions. This European Standard relates to office furniture of contemporary design.

The dimensions in this standard are based on the requirements of anthropometric measurements, mechanical design, subjective preference and other factors.

The dimensional requirements of the tables and desks are based upon the 5th and 95th percentile of the European office user group. In general, this is the 5th percentile female and the 95th percentile male (from 1493 mm to 1913 mm for the stature height). To accomplish the needs of users outside this range, individual solutions can be applied. Some European countries can have 5th percentile females and/or 95th percentile males outside this European user group.

1 Scope

This European Standard specifies dimensions of work tables and desks for office tasks to be undertaken in a seated, a sit stand or standing position.

It includes neither dimensions for storage unit nor those for other tables in the office area or reception desks.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

N/A

3 Terms and definitions

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

3.1

height of the work surface

vertical dimension measured from the floor to the top of the work surface at the edge closest to the user

3.2

work table/desk Type A

height adjustable; the height can be changed by the user during use

3.3

work table/desk Type B

height selectable; the height can be adapted to the user at installation

3.4

work table/desk Type C

fixed height

3.5

work table/desk Type D

limited height selectable or adjustable

3.6

sit-stand work table/desk

height adjustable allowing different work positions from seated to standing

3.7

desk top thickness

thickness of the work surface and all protruding parts or elements of the work table/desk within the width and depth of the legroom

3.8

levelling device

leg component designed to allow the work surface to be set horizontal

3.9

desk top depth

depth of working surface including any extension elements on the same plane

4 Dimensions

4.1 Measurement procedure

Position the work table/desk on a flat horizontal and rigid floor surface, with levelling device(s) fully closed.

Inclinable desk top work surfaces shall be set to the horizontal or as near to the horizontal as possible.

Before commencing measurement procedure, it shall be determined whether the table/desk is for sitting, standing or sit/stand use.

The minimum and maximum height of work surface shall be measured at the front edge (see Figure 1) and the adjustment range shall be recorded. For height selectable work tables/desks type B and D the minimum height increments shall also be recorded.

The legroom depth shall be measured at the working position and with the rear edge of the work table/desk placed against a vertical wall.

Figure 1 shows the legroom for all work surfaces which have straight front edges at least all along the width, W, see Table 1. In these cases, the legroom shall be rectangular with dimensions as specified in Table 1.

Figure 2 shows the legroom for all work surfaces with non-straight front edges. In these cases, the legroom shall be curved with dimensions as specified in Table 1.

4.2 Requirements

The dimensions of tables/desks shall be as specified in Table 1.

Table 1 — Table/desk dimensions in millimetres

Dimensions			Work table/desk type						
			Type A		Type B	Type C	Type D		
			Fully adjustable		Fully selectable	Fixed height	Limited adjustable or limited selectable ^e		
h ₁	Height of the work surface	Sitting only	Minimum range 650 - 850	Minimum range 650 - 850 ^a	740 ± 20	-allow yes	Min 680	Max 760	+allow yes
		Standing only	Minimum range 950 - 1250	Minimum range 950 - 1250 ^a	1050 ± 20	-allow yes	Min 1000	Max 1180	+allow yes
		Sit/stand	Minimum range 650 - 1250	N/a	N/a	Minimum range 680 - 1180			
t ₁ and t ₂	Maximum desk top thickness (see Figure 1)	At the front, t ₁	55 ^b	55 ^b	70	70			
		At 500 mm from the front edge, t ₂	80 ^b	90 ^b	100	100			
k ₁	Minimum height of knee clearance for standing position only (see Figure 3)	Applies only to tables with a height more than 850 mm	700 ^d	700 ^d	700 ^d	700 ^d			
k ₂	Minimum depth of knee clearance for standing position only (see Figure 3)		80	80	80	80			
k ₃	Minimum depth of foot clearance for standing position only (see Figure 3)		150	150	150	150			
f ₁ and f ₂	Minimum height of minimum foot clearance	Sitting only and sit/stand From 600 mm to 800 mm from the front edge, f ₁	120	120	120	120			
		Standing only From front edge to 150 mm, f ₂	120	120	120	120			
g ₁	Minimum legroom depth ^c (see Figure 1)	Sitting only and sit/stand	800	800	800 ^f	800			

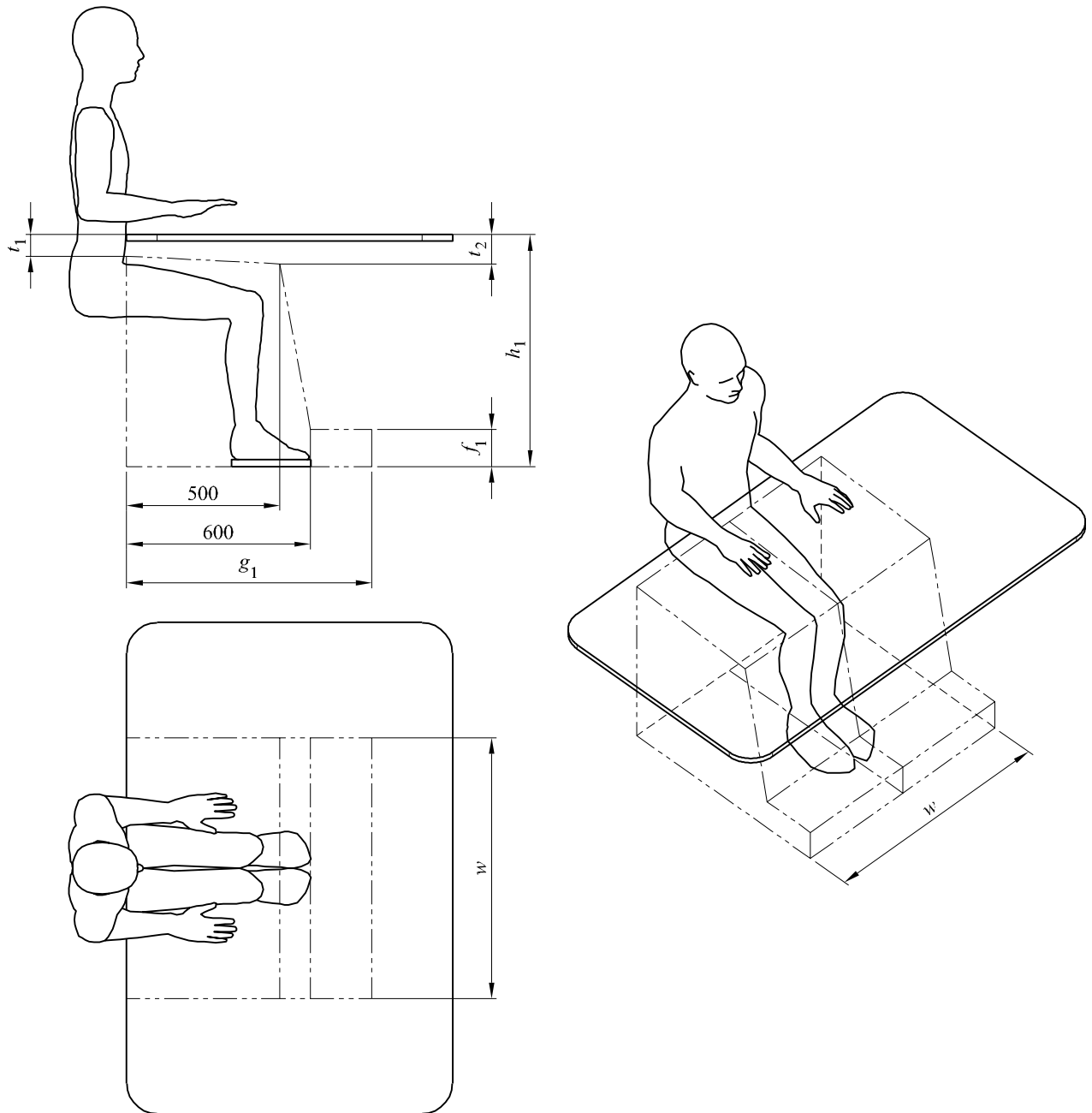
Table 1 — Table/desk dimensions in millimetres (continued)

D	Minimum desk top depth ^g		800	800	800 ^f	800
W	Minimum legroom width	Sitting only and sit/stand	1200	1000	850	850
		Standing only	790	790	790	790
<p>a Maximum increment of 20 mm</p> <p>b Only applies to sitting and sit/stand work tables/desks</p> <p>c The construction of the product shall ensure the minimum legroom depth</p> <p>d Measured from the floor</p> <p>e The minimum and maximum values shall be obtained</p> <p>f 600 mm can in some situations be acceptable, e.g. when 17" or smaller flat screens are used, providing that the work surface is not against the wall and that two people are not sitting one in front of each other. Information about these limitations shall be provided with the product</p> <p>g The dimension D is measured as the smallest dimension at the work area</p>						

NOTE 1 Users outside of the range given in the introduction may need furniture of different dimensions.

NOTE 2 There is no dimension specified for the width (length) of a work table/desk. The width and shape of the work tables/desks can vary greatly. The actual size of the work surface depends on the individual user's needs and task requirements (see EN ISO 9241-5).

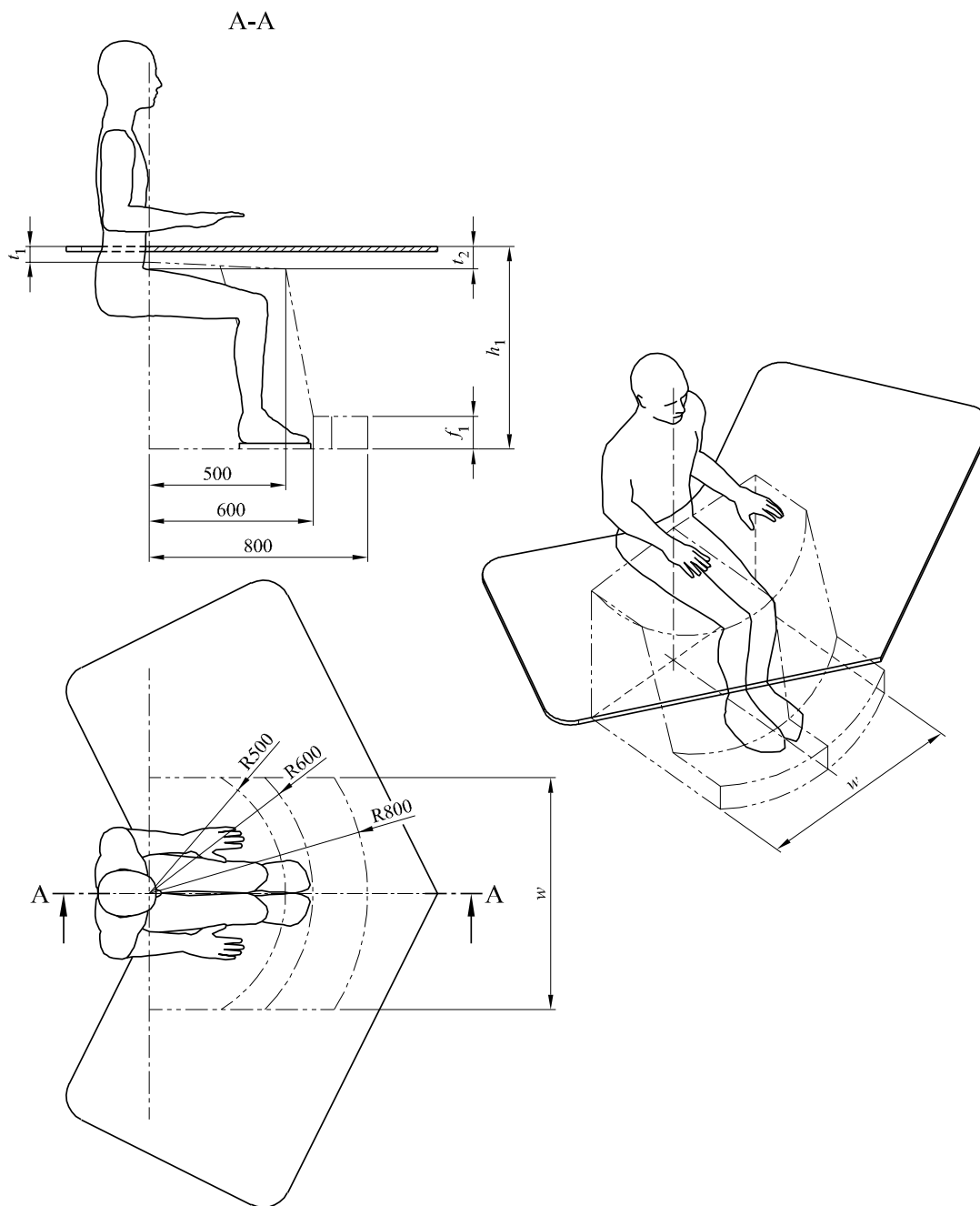
Dimensions in millimetres



Key

- h_1 height to the top of the work surface
- t_1 maximum desk top thickness at the front
- t_2 maximum desk top thickness at 500 mm from the front edge
- f_1 height of foot clearance
- g_1 minimum legroom depth
- w minimum legroom width

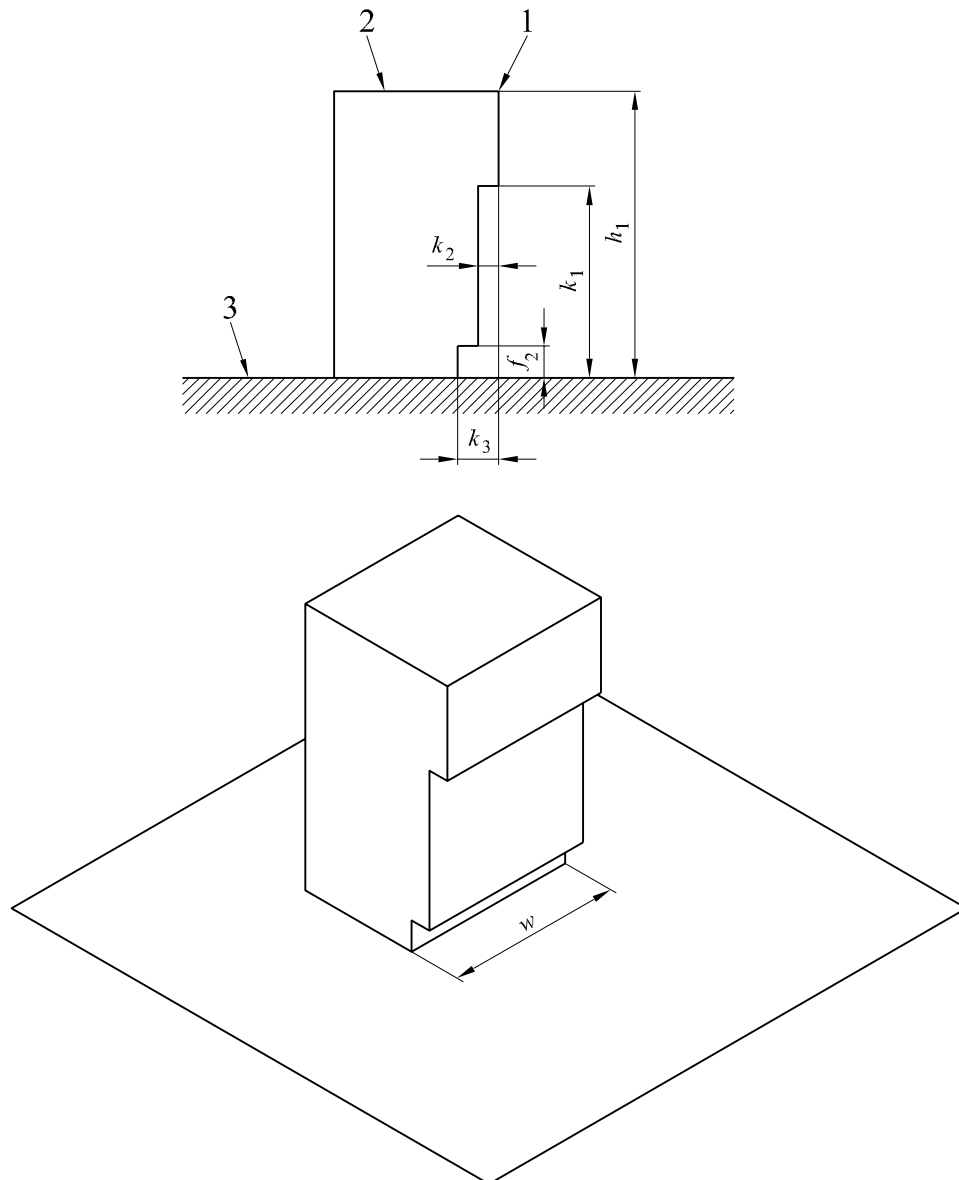
Figure 1 — Legroom and height for work tables/desks with straight front edges



Key

- h_1 height to the top of the work surface
- t_1 maximum desk top thickness at the front
- t_2 maximum desk top thickness at 500 mm from the front edge
- f_1 height of foot clearance
- g_1 minimum legroom depth
- w minimum legroom width

Figure 2 — Legroom and height for work tables/desks with non-straight front edges



Key

- 1 front edge
- 2 top of the work surface
- 3 floor
- h_1 height to the top of the work surface
- k_1 height of knee clearance
- k_2 depth of knee clearance
- k_3 depth of foot clearance
- f_2 height of foot clearance
- w minimum legroom width

Figure 3 — Foot and knee clearance dimensions for standing position only

Annex A (informative)

General ergonomic principles and explanations to Table 1

A.1 General

The functional dimensions of work tables/desks are shown in Table 1. There are four types of desks, A, B, C and D, based on their height adjustability/selectability. The dimensional requirements vary depending on how they are used i.e. whether the users are sitting or standing or can vary their posture from sitting to standing (and anything in between).

The legroom clearance height is determined by the maximum desk top thicknesses t_1 at the front edge and t_2 at 500 mm from the front edge. The reason for this is to make the measurement process simpler. The maximum desk top thickness has been calculated by subtracting the legroom height requirement from height of the work surface of a fixed height desk. The work tables/desks complying with the Type A and B height of the work surface and the maximum desk top thickness requirements will accommodate the 95th percentile European male.

The minimum foot clearance height is specified to allow a clearance under any part of the rear of the work surface/desk such as a modesty panel so that users can place their feet on the floor without hitting any part of the desk. For standing work tables/desks only, there is an additional requirement for the minimum foot clearance depth so that users standing in front of the table/desk can work without hitting any obstruction under the work table/desk.

The minimum legroom depth and width for sitting and sit/stand work tables/desks is shown in Figure 2. For these work tables/desks, only the legroom depth is specified at knee height and at floor level. This should be deeper than the depth at knee height in order to allow the users to stretch their legs forward at angle of 30 degrees between their lower leg and the vertical and without their feet hitting any part of the work table/desk at the floor level.

The minimum desk top depth (800 mm and 600 mm in some situations) can be different from the required minimum legroom depth. The minimum desk top depth is based on the comfortable eye to monitor distance which should be between 450 mm to 750 mm as specified in A.2.12 of EN ISO 9241-5:1999.

The minimum legroom width for sitting applications (i.e. the gap between the legs or any part or component of the work table/desk at the sides) is specified sufficiently large to allow users to rotate their chairs rather than twist their spines when reaching sideways. The minimum legroom width for standing applications is based on the distance between the outsides of users' legs when standing with their legs slightly apart.

The dimensions specified in Table 1 are based upon the following anthropometric data for sitting and standing work taking limitations in technology into account. Body dimensions shown in Table A.1 for the European populations are taken from PeopleSize 2008, by Open Ergonomics.

A.2 Anthropometric data for sitting and standing work

The body dimensions which form the basis of the table/desk dimensions given in Table 1 are shown in Table A.1 for sitting and standing. This anthropometric data is taken from PeopleSize 2008, by Open Ergonomics.

All dimensions are in mm and appropriate ones include 30 mm shoe heel height as specified in EN ISO 14738.

Table A.1 — Anthropometric data (including 30 mm shoe thickness)

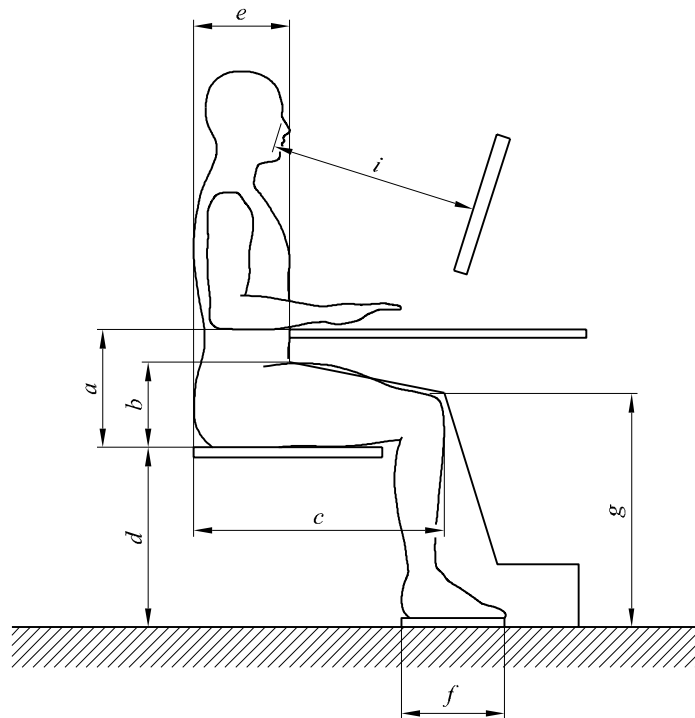
Symbol	Dimension	Dutch			Italian			French			German			Belgian			Swedish			British		
		5% female	95% male	95% female	5% female	95% male	95% female	5% female	95% male	95% female	5% female	95% male	95% female	5% female	95% male	95% female	5% female	95% male	95% female	5% female	95% male	95% female
a (see Figure A.1)	Seat to elbow	187	302	n/a	197	293	n/a	279	279	n/a	201	277	n/a	204	287	n/a	192	292	n/a	197	275	n/a
b (see Figure A.1)	Thigh thickness	128	169	n/a	112	159	n/a	220	220	n/a	131	195	n/a	133	175	n/a	130	184	n/a	132	194	n/a
c (see Figure A.1)	Posterior to knee	565	689	n/a	-	-	-	-	-	n/a	546	677	n/a	549	670	n/a	540	667	n/a	537	673	n/a
d (see Figure A.1)	popliteal height	399	521	n/a	-	-	-	-	-	n/a	390	503	n/a	-	-	n/a	430	550	n/a	383	500	n/a
e (see Figure A.1)	Body thickness	227	341	n/a	171	307	n/a	190	341	n/a	220	379	n/a	194	296	n/a	203	352	n/a	220	377	n/a
f (see Figure A.1)	Foot length	225	291	n/a	218	282	n/a	218	288	n/a	224	289	n/a	218	281	n/a	223	286	n/a	220	287	n/a
g (see Figure A.1)	Top of knee height	-	635	n/a	471	612	n/a	488	620	n/a	497	626	n/a	-	-	n/a	498	633	n/a	488	622	n/a
h (see Figure A.2)	Elbow height-stand	979	1230	n/a	-	-	n/a	963	1219	n/a	969	1215	n/a	-	-	n/a	987	1211	n/a	951	1208	n/a
-	hip breadth-sitting	366	437	464	304	394	412	336	432	464	348	435	472	354	412	463	372	445	466	346	432	469
-	hip breadth-stand	-	-	-	-	-	-	-	-	-	324	407	427	-	-	-	-	-	-	321	405	427

Table A.1 — Anthropometric data (including 30 mm shoe thickness) (continued)

Symbol	Dimension	Dutch			Italian			French			German			Belgian			Swedish			British		
		5% female	95% male	95% female	5% female	95% male	95% female	5% female	95% male	95% female	5% female	95% male	95% female	5% female	95% male	95% female	5% female	95% male	95% female	5% female	95% male	95% female
Desk/table Dimensions																						
t_1	(desk top thickness at front)	59	133	-	85	134	-	59	59	-	70	82	-	71	112	-	62	108	-	65	81	-
t_2	(desk top thickness at 500mm)		188														124	209		92	153	
h_1	(desk top height sitting) (see Figure A.3)	586	823								591	780					622	842		580	775	
h_1	(desk top height standing) (see Figure A.4)	979	1230					963	1219		969	1215					987	1211		951	1208	
d_1	(legroom depth at knee) (see Figure A.5)	462		-	-	-	-	-	-	-	457			476			464	452		453	427	

Source: PeopleSize 2008, Open Ergonomics Ltd

Note : All dimensions are in mm

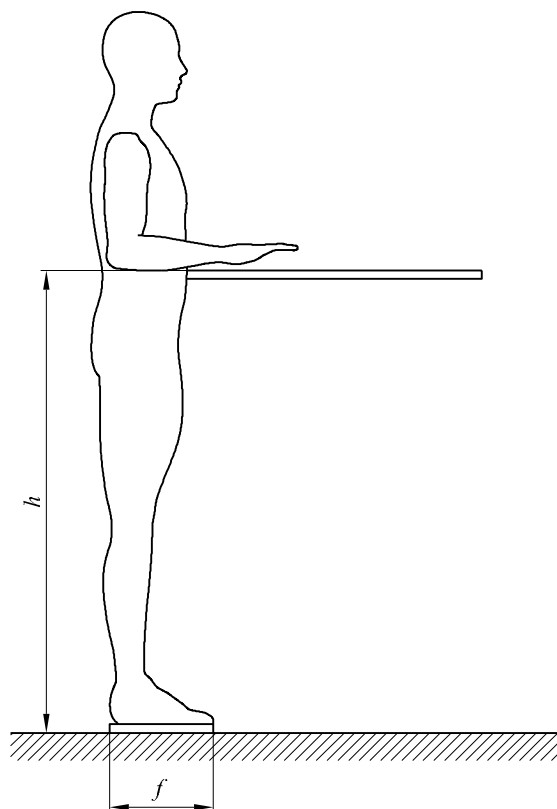


Key

- a dimension from seat to elbow
- b thigh thickness
- c dimension from posterior to knee
- d popliteal height
- e body thickness
- f foot length
- g top of knee height
- i eye to monitor distance

Figure A.1 — Dimensions for sitting posture

NOTE (i) Eye to monitor distance is = 450 mm to 750 mm (EN ISO 9241-5)

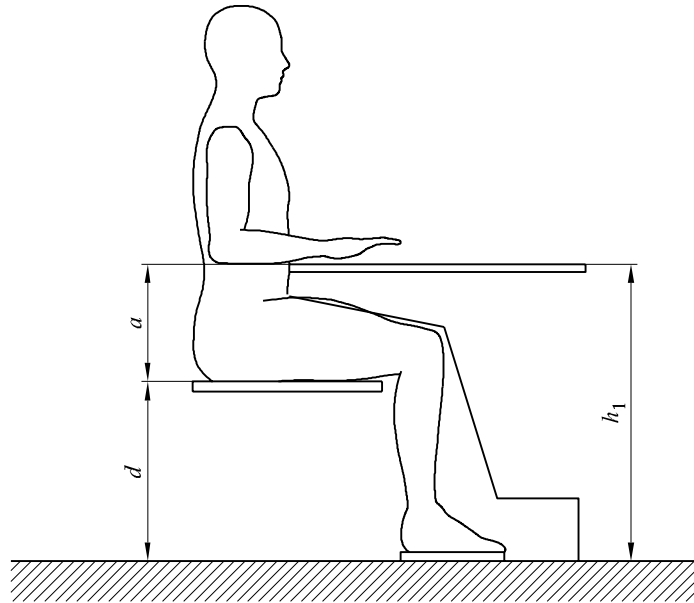


Key

- f foot length
- h elbow height-stand

Figure A.2 — Dimensions for standing posture

The calculations used in determining the dimension of tables/desk are shown below. It should be noted that these are theoretical approximate dimensions.



Key

- a dimension from seat to elbow
- d popliteal height
- h_1 height to the top of the work surface

Figure A.3 — Dimension h_1 for sitting posture

Sitting Type C (fixed height):

$$h_1 = a_{95^{\text{th}}} + d_{95^{\text{th}}}$$

As can be seen from Table A.1, the Swedish population has the largest seat to elbow height (a) and the largest popliteal height (d)

Therefore $h_1 = 292 + 550 = 842$

Sitting Type A or B (fully adjustable or selectable):

$$h_1 \text{ minimum} = a_{5^{\text{th}}} + d_{5^{\text{th}}}$$

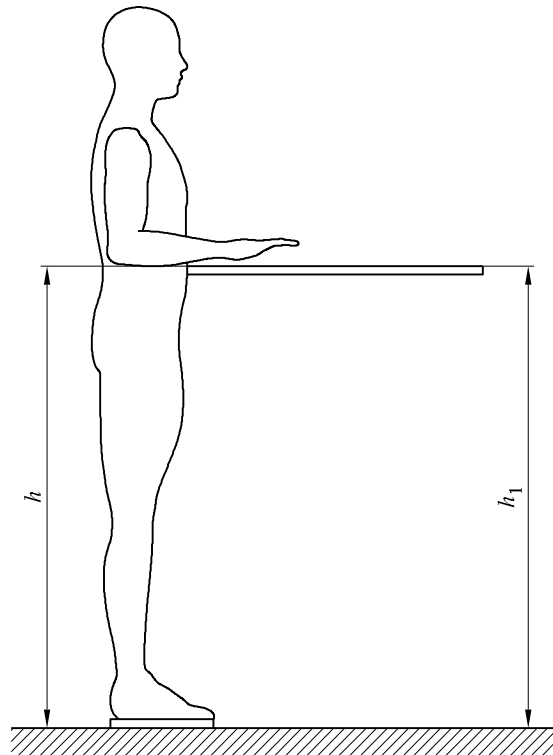
As can be seen from Table A.1, the British population has the smallest seat to elbow height (a) and the smallest popliteal height (d)

Therefore $h_1 \text{ minimum} = 197 + 383 = 580$

$$h_1 \text{ maximum} = a_{95^{\text{th}}} + d_{95^{\text{th}}}$$

As can be seen from Table A.1, the Swedish population has the largest seat to elbow height (a) and the largest popliteal height (d)

Therefore $h_1 \text{ maximum} = 292 + 550 = 842$



Key

h elbow height-stand

h_1 height to the top of the work surface

Figure A.4 — Dimension h_1 for standing posture

Standing Type C (fixed height):

$$h_1 = (h_{95^{\text{th}} \text{ percentile}} + h_{5^{\text{th}} \text{ percentile}}) / 2 = 1061$$

Standing Type A or B (Fully adjustable or selectable):

$$h_1 \text{ minimum} = h_{5^{\text{th}} \text{ percentile}}$$

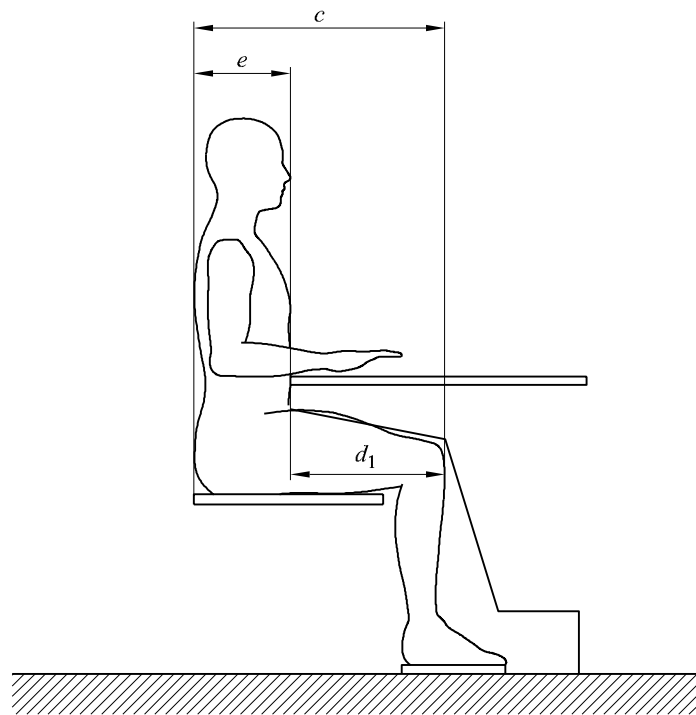
As can be seen from Table A.1, the British population has the smallest standing elbow height (h)

Therefore **h_1 minimum = 951**

$$h_1 \text{ maximum} = h_{95^{\text{th}} \text{ percentile}}$$

As can be seen from Table A.1, the Dutch population has the largest standing elbow height (h)

Therefore **h_1 maximum = 1230**



Key

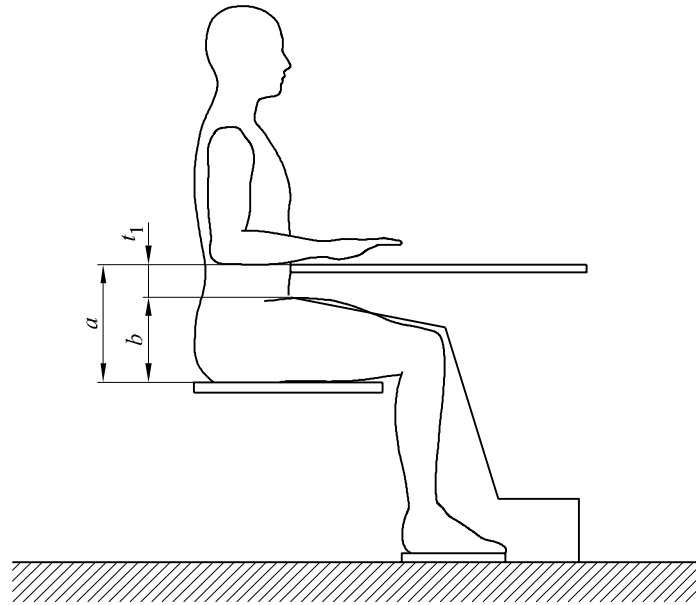
- c dimension from posterior to knee
- e body thickness
- d_1 minimum depth of legroom at knee

Figure A.5 — Dimension d_1

$$d_1 = c \text{ 95}^{\text{th}} \text{ percentile} - e \text{ 5}^{\text{th}} \text{ percentile}$$

As can be seen from Table A.1, the Belgian population has the largest difference between posterior to knee dimension (c) and the body thickness (e)

Therefore $d_1 = 670 - 194 = 476$



Key

- a dimension from seat to elbow
- b thigh thickness
- t_1 maximum desk top thickness at the front

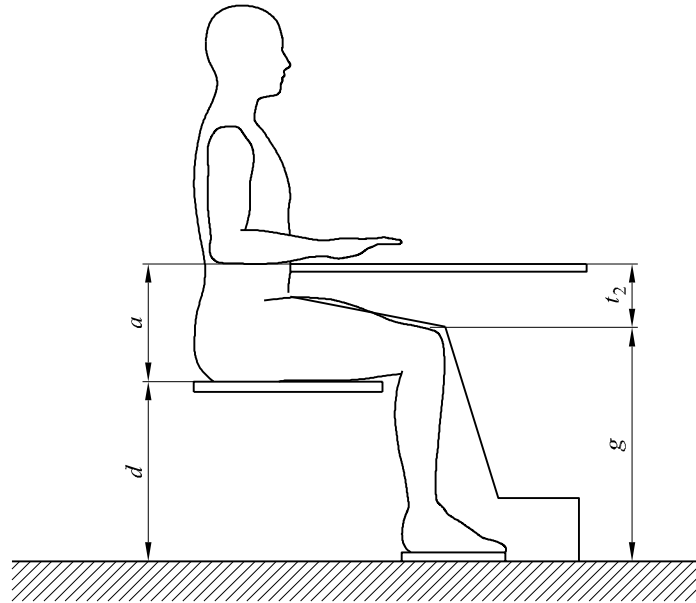
Figure A.6 — Dimensions t_1

Sitting:

$$t_1 = a \text{ 5}^{\text{th}} \text{ percentile} - b \text{ 5}^{\text{th}} \text{ percentile}$$

As can be seen from Table A.1, the Dutch and French 5th percentile females has the smallest dimension between the seat to elbow (a) and thigh thickness (b)

Therefore $t_1 = 187 - 128 = \mathbf{59}$



Key

- a dimension from seat to elbow
- d popliteal height
- g top of knee height
- t₂ maximum desk top thickness at 500 mm from the front edge

Figure A.7 — Dimension t₂

Sitting:

$$t_2 = a \text{ 5}^{\text{th}} \text{ percentile} + d \text{ 5}^{\text{th}} \text{ percentile} - g \text{ 5}^{\text{th}} \text{ percentile}$$

As can be seen from Table A.1, the UK 5th percentile females has the smallest dimension between the sitting desk height (h₁) and top of knee height (g)

Therefore $t_2 = 197 + 383 - 488 = 92$

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- [2] EN ISO 14738, Safety of machinery – Anthropometric requirements for the design of workstations at machinery (ISO 14738:2002)
- [3] EN 527-2:2002, Office furniture – Work tables and desks – Part 2: Mechanical safety requirements
- [4] People Size 2008 by Open Ergonomics (<http://www.openerg.com/>)

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