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**Footwear — Sizing — Vocabulary**

*Chaussures — Pointures — Vocabulaire*

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## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see [www.iso.org/directives](http://www.iso.org/directives)).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see [www.iso.org/patents](http://www.iso.org/patents)).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC 137, *Footwear sizing designations and marking systems*.

This first edition of ISO 19408 cancels and replaces ISO/TS 19408:2015, which has been technically revised.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at [www.iso.org/members.html](http://www.iso.org/members.html).

# Footwear — Sizing — Vocabulary

## 1 Scope

This document defines terms commonly used for measuring feet and lasts and for determining the size of footwear.

This document complements ISO 19952.

## 2 Normative references

There are no normative references in this document.

## 3 Terms and definitions

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

### 3.1 Foot dimensions and shoe sizing

#### 3.1.1

##### **central line of foot**

line that connects the centre of the back of the heel (maximum point of the heel curve) and a point in the forefoot area

Note 1 to entry: See [Figure A.1](#) c) and d), and [Figure A.5](#) b).

Note 2 to entry: There are two methods to define the point in the forefoot:

- Method 1: at the end of the second toe;
- Method 2: in the middle of the *tread width of the foot* ([3.1.15](#)).

#### 3.1.2

##### **design allowance**

additional allowance to the *effective shoe length* ([3.1.3](#)) added to the forefoot area of the last

Note 1 to entry: See [Figure A.2](#).

#### 3.1.3

##### **effective shoe length**

distance of the *foot length* ([3.1.4](#)) including a *toe allowance* ([3.2.16](#))

Note 1 to entry: See [Figures A.2](#) and [A.3](#).

#### 3.1.4

##### **foot length**

maximum horizontal distance from the centre of the back of the heel (maximum point of heel curve) to the end of the most prominent toe, with the subject standing with the weight of the body equally distributed on both feet, barefoot or wearing thin hose that does not significantly affect the dimensions of the foot

Note 1 to entry: There are different methods to measure the foot length:

- Method 1: it is measured along the *inside tangent* (3.1.6) (see [Figure A.1](#) a) and b);
- Method 2: it is measured parallel to the *central line of foot* (3.1.1). There are two methods of measuring the central line (method 2 a and 2 b). See [Figure A.1](#) a), c) and d).

### 3.1.5

#### **heel height of shoe**

vertical height of the extreme rear end of the heel of the shoe down to the ground plane

Note 1 to entry: See [Figure A.3](#).

### 3.1.6

#### **inside tangent**

vertical plane tangential to the point of maximum inside heel swell and the point of maximum swell at the first metatarsal head

Note 1 to entry: See [Figure A.1](#) b) and [Figure A.5a](#)).

### 3.1.7

#### **instep point of foot**

intersection of the vertical (normal) plane at a given percentage of foot length with the highest point on the upper (dorsal) surface of the foot

Note 1 to entry: See [Figure A.16](#).

Note 2 to entry: There are different percentages used to mark the instep point:

- Method 1: 50 % of foot length;
- Method 2: 55 % of foot length.

### 3.1.8

#### **joint girth of the foot**

#### **anatomic ball girth of the foot**

circumference of the foot in a vertical plane around the heads of the first and fifth metatarsal bones

Note 1 to entry: Measurement is made under the same conditions as *foot length* (3.1.4).

Note 2 to entry: See [Figure A.4](#).

### 3.1.9

#### **length grading interval**

difference between adjacent whole shoe sizes

### 3.1.10

#### **linear width**

maximum horizontal distance,  $o$ , between the outside swell of the head of the first metatarsal and outside swell of the head of the *fifth metatarsal of the foot* (see [Figure A.12](#)) or the corresponding points at the last

Note 1 to entry: Measurement of the foot is made under the same conditions as *foot length* (3.1.4). There are two methods to obtain the first and fifth metatarsal head points:

- Method 1: the *inside tangent* (3.1.6) and the parallel line touching the fifth metatarsal [see [Figure A.5](#) a)];
- Method 2: the inside and outside tangent lines which are parallel with the *central line of foot* (3.1.1) touching the two points [see [Figure A.5](#) b)].

### 3.1.11

#### **shoe size**

designated size marking of a shoe or last made for a given *foot length* (3.1.4) in any given shoe sizing system

**3.1.12****shoe width**

designated marking indicating the joint/ball girth or width fitting of the footwear or last, usually based on the joint girth or width measurement of the last

Note 1 to entry: Designation can be by letters, e.g. A, B, C, or numbers, e.g. 1, 2, 3.

**3.1.13****stick width of the foot****linear width**

perpendicular distance between the first metatarsal head and the fifth metatarsal head

Note 1 to entry: See [Figure A.12](#).

Note 2 to entry: Measurement is made under the same conditions as *foot length* ([3.1.4](#)). There are two methods to obtain the first and fifth metatarsal head points:

- Method 1: the *inside tangent* ([3.1.6](#)) and the parallel line touching the *fifth metatarsal* [see [Figure A.5 a](#)];
- Method 2: the inside and outside tangent lines which are parallel with the *central line of foot* ([3.1.1](#)) touching the two points. There are two methods of central line (method 2 a and 2 b) [see [Figure A.5 b](#)].

**3.1.14****width grading interval**

difference between adjacent girth or width fittings within the same shoe size or from shoe size to shoe size

**3.1.15****tread width of ball area of foot**

distance  $b$  between the maximum swell of the first metatarsal as a point of the foot line touching the ground and the maximum swell of the fifth metatarsal as a point of the foot line touching the ground

Note 1 to entry: See [Figures A.5](#) and [A.12](#).

**3.1.16****long heel girth of foot**

circumference around the foot passing through the point at the back of the heel where the foot just touches the ground on which the foot stands and the *instep point of foot* ([3.1.7](#))

Note 1 to entry: See [Figure A.16](#).

**3.1.17****ankle girth**

smallest horizontal girth,  $i$ , at the lower leg over the malleolus

Note 1 to entry: See [Figure A.16](#).

**3.1.18****calf girth**

maximum horizontal girth,  $u$ , in the calf area of lower leg

Note 1 to entry: See [Figure A.16](#).

**3.1.19****under knee girth**

smallest horizontal girth,  $w$ , below the knee and above calf

Note 1 to entry: See [Figure A.16](#).

### 3.1.20

#### **short heel girth of foot**

shortest circumference,  $t_1$ , around the foot passing through the point at the back of the heel where the foot just touches surface on which the foot stands

Note 1 to entry: See [Figure A.16](#).

### 3.1.21

#### **shoe**

assembly of coverings for the foot usually made of a strong material

## 3.2 Last dimensions

### 3.2.1

#### **bottom pattern length of last**

#### **last bottom length**

length of the last along the bottom surface of the central line from the heel point to the furthestmost prominent point of the feather line

Note 1 to entry: See [Figure A.6](#).

Note 2 to entry: The heel point is the furthestmost back point of the heel at the central line [see [Figure A.10](#) a)]

### 3.2.2

#### **central line of last bottom pattern**

designed line at the last bottom that connects the heel point and a point in the forepart area of the last

Note 1 to entry: The heel point is the furthestmost back point of the heel at the central line [see [Figure A.10](#) a)]

Note 2 to entry: There are three methods to design that line:

- Method 1: second point in the forepart area is the prominent point of the last top at the feather line [see [Figure A.10](#) a)];
- Method 2: second point is in the middle of the *tread width of the last* ([3.1.15](#)) [see [Figure A.10](#) b)];
- Method 3: the line constructed following [Figure A.14](#).

### 3.2.3

#### **effective last length**

*foot length* ([3.1.4](#)) value, measured from the back of the *heel curve of the last* ([3.2.5](#)) and along the bottom of the last, plus *toe allowance* ([3.2.16](#))

Note 1 to entry: See [Figure A.3](#) and [A.11](#).

### 3.2.4

#### **feather line**

perimeter (edge) of the bottom pattern of the last

Note 1 to entry: See [Figure A.7](#).

### 3.2.5

#### **heel (or back) curve of last**

profile line of the heel part of the lasts

Note 1 to entry: See [Figure A.6](#).

**3.2.6****heel height of last**  
**technical heel height**

vertical distance between the underside of the extreme end of the last and the ground plane with the last in its normal orientation

Note 1 to entry: See [Figure A.8](#).

**3.2.7****heel seat**

section of the last bottom between the extreme rear point of heel and the point where the waist curve begins, with the last in its normal orientation

Note 1 to entry: See [Figure A.11](#).

**3.2.8****heel width**  
**tread width of heel**

measurement of heel that is a distance of a given percentage of foot length

Note 1 to entry: The foot length of the marked shoe size is selected from the conversion table in ISO 19407. The given percentages of this length are measured. The measured distance of the maximum of heel curve is subtracted from this value. This value is then marked at the central line of the last bottom measured from the back of the heel. A line is drawn perpendicular to the central line up to the lateral and medial feather line.

**3.2.8.1****tread width of heel**

distance,  $q$ , between the two points marked is the *heel width* ([3.2.8](#))

Note 1 to entry: See [Figure A.13](#).

**3.2.8.2****linear width of heel**  
**swell width**

distance,  $r$ , between the lateral and medial points following the contour of the surface of the bottom

Note 1 to entry: Measured by extending the line of the *heel width* ([3.2.8](#)) up to the maximum swell of the heel part.

Note 2 to entry: See [Figure A.13](#).

**3.2.9****instep point of last**

point at the intersection between a plane and the highest point upper (dorsal) surface of the last

Note 1 to entry: See [Figure A.15](#).

Note 2 to entry: There are three methods to define the plane:

- Method 1: perpendicular to the central line of the last bottom at 42 % of effective last length;
- Method 2: perpendicular to the central line of the last bottom at 50 % of the foot length;
- Method 3: perpendicular to the last bottom at the point G1 ([Figure A.14](#)).

**3.2.10****joint girth of last**  
**ball girth of last**

circumference around the last in the forepart corresponding to the approximate position of the ball joint of the foot

### 3.2.11

#### **last length**

sum of the bottom pattern *length of last* (3.2.1),  $d$ , measured along the surface of the bottom of the last, maximum of *heel curve of the last* (3.2.5),  $a$ , and hang over last top,  $e$ , with the last in its normal orientation

Note 1 to entry: See [Figure A.6](#).

Note 2 to entry: The dimension,  $e$ , can be zero.

### 3.2.12

#### **last toe height**

maximum distance between the last bottom and the upper surface of the last measured on a line perpendicular to the last bottom plane and at the *effective last length* (3.2.3)

Note 1 to entry: See [Figure A.11](#).

### 3.2.13

#### **last toe spring**

vertical distance between the underside of the last at the extreme toe end and the ground plane with the last in its normal orientation

Note 1 to entry: See [Figure A.8](#).

### 3.2.14

#### **long heel girth of last**

girth  $t_2$  from the point of the middle of the heel at the feather line, crossing the instep point, back to the heel point

Note 1 to entry: See [Figure A.15](#).

### 3.2.15

#### **stick last length**

longest dimension of the last from the heel to the toe with the last in a flat position (without heel height)

Note 1 to entry: See [Figure A.9](#).

### 3.2.16

#### **toe allowance**

addition to the *foot length* (3.1.4) that is necessary to accommodate the dynamic functioning of the foot

Note 1 to entry: See [Figures A.2](#) and [A.3](#).

### 3.2.17

#### **tread width of the ball area of last**

distance,  $b$ , between the maximum swell of the first metatarsal as a point of the last feather line and the maximum swell of the fifth metatarsal as a point of the last feather line

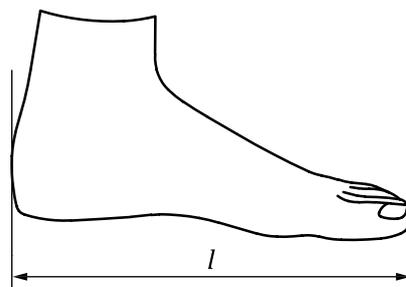
Note 1 to entry: See [Figure A.12](#).

Note 2 to entry: There are different methods of measuring:

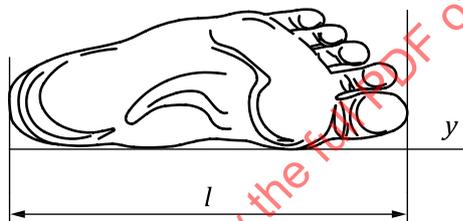
- Method 1: the *inside tangent* (3.1.6) and the parallel line touching the ball points of the last;
- Method 2: the inside and outside tangent lines which are parallel with the *central line of foot* (3.1.1) touching the two points;
- Method 3: this method uses the points E1 and F1 to find these points ([Figure A.14](#)).

**Annex A**  
(informative)

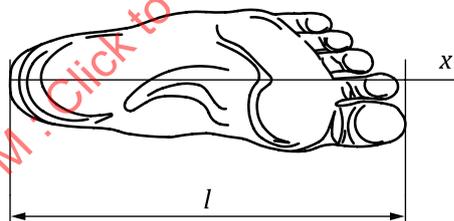
**Figures**



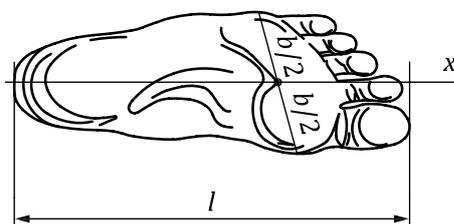
a) Foot length (method 1 and 2)



b) Foot length (method 1)



c) Foot length (method 2 a)



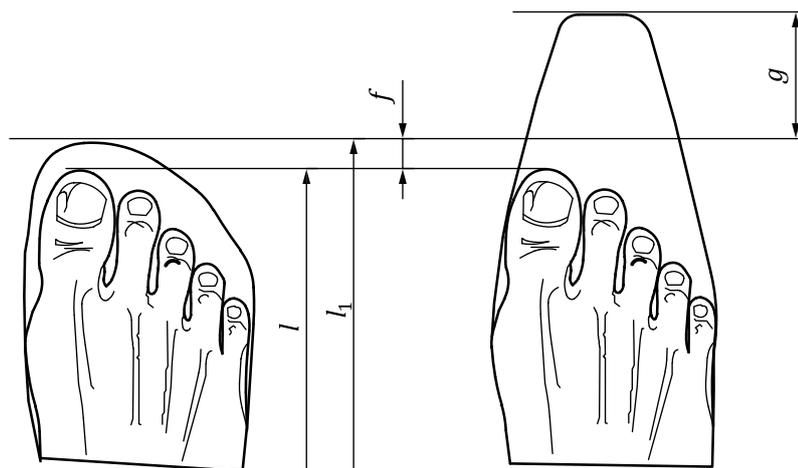
d) Foot length (method 2 b)

**Key**

*x* central line  
*y* inside tangent

*l* foot length  
*b* tread width of the foot

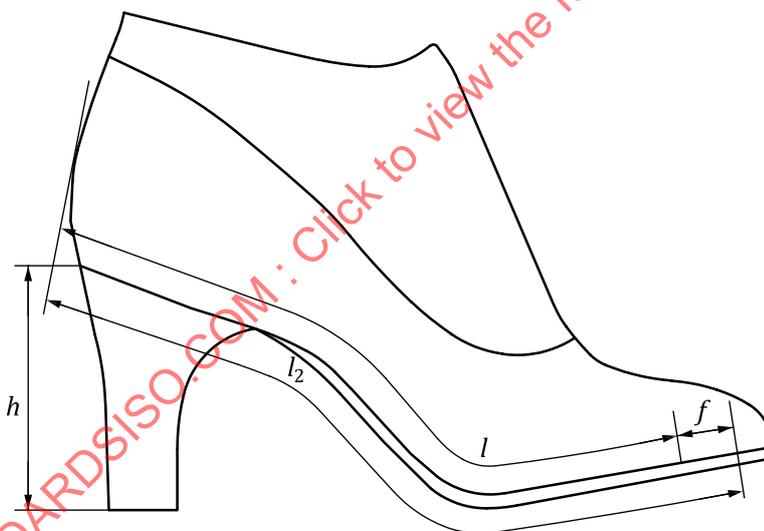
**Figure A.1 — Foot length**



**Key**

- $l$  foot length
- $l_1$  effective shoe length
- $f$  toe allowance
- $g$  design allowance

**Figure A.2 — Design allowance**



**Key**

- $l_2$  effective shoe or last length
- $l$  foot length
- $f$  toe allowance
- $h$  heel height of shoe

**Figure A.3 — Toe allowance**

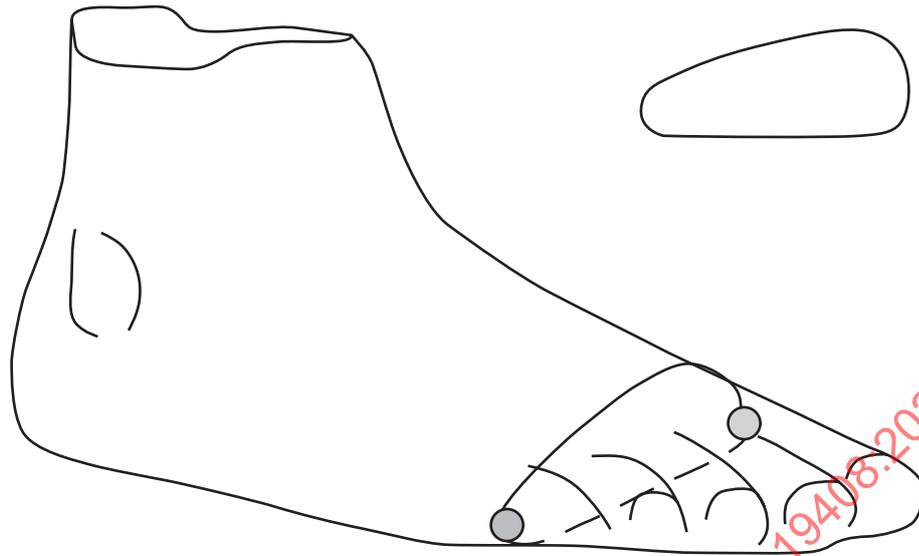
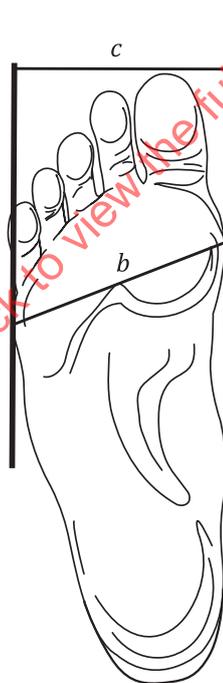
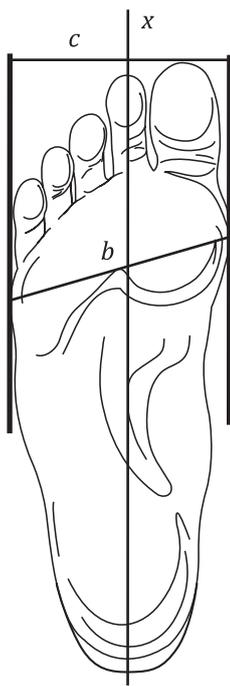


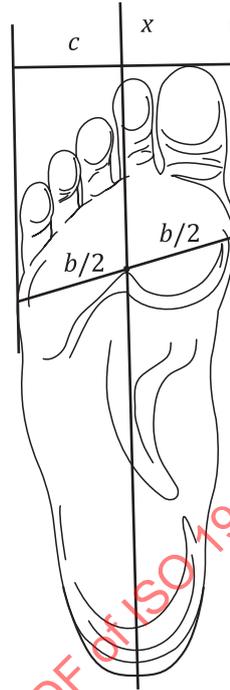
Figure A.4 — Joint girth of the foot



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a) Stick width of the foot (method 1)

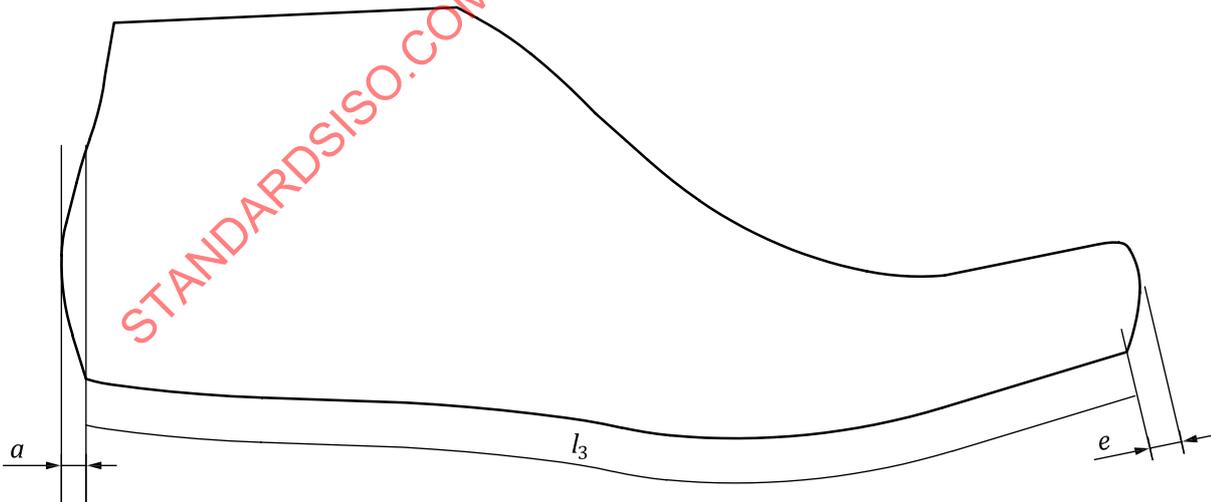


b) Stick width of the foot (method 2 a and 2 b)

**Key**

- $x$  central line
- $y$  inside tangent
- $b$  tread width of the foot
- $c$  stick width of the foot

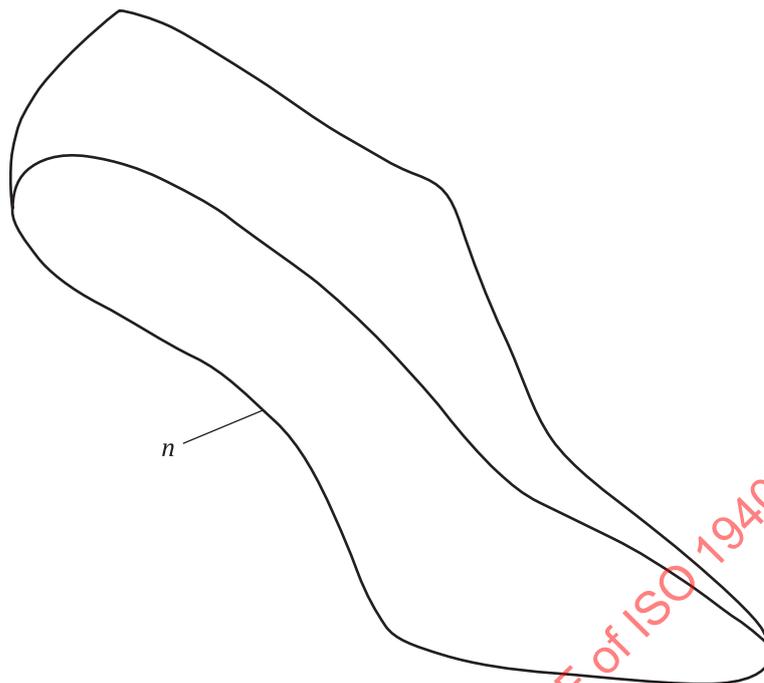
Figure A.5 — Stick width of the foot



**Key**

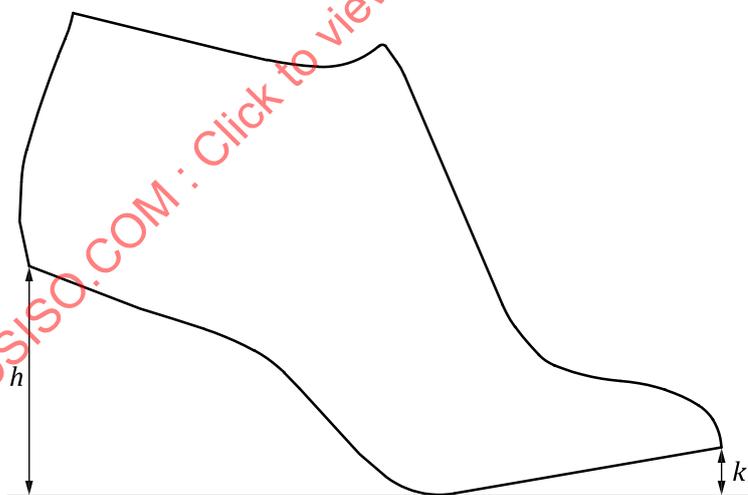
- $a$  maximum of heel (or back) curve
- $l_3$  bottom pattern length
- $e$  hang over last top

Figure A.6 — Last length



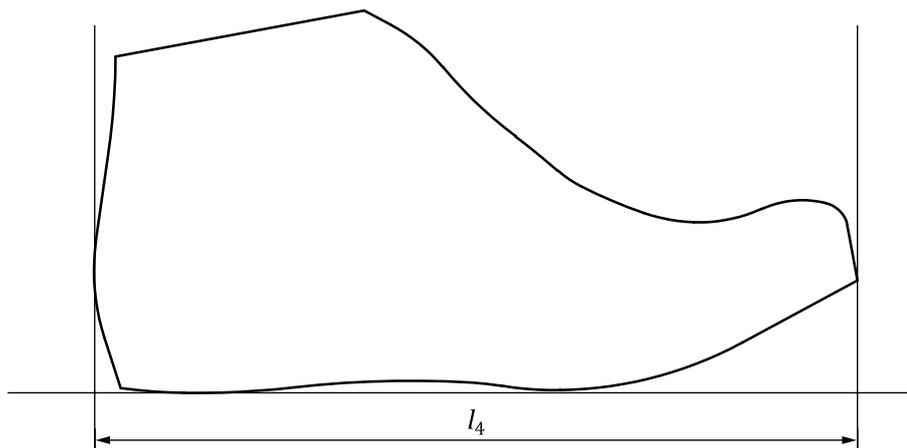
**Key**  
*n* feather line

**Figure A.7 — Feather line**



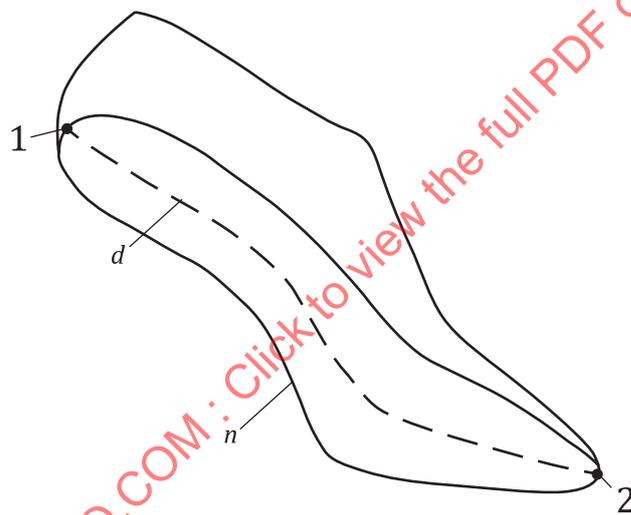
**Key**  
*h* heel height of last  
*k* toe spring of last

**Figure A.8 — Technical heel height and toe spring**

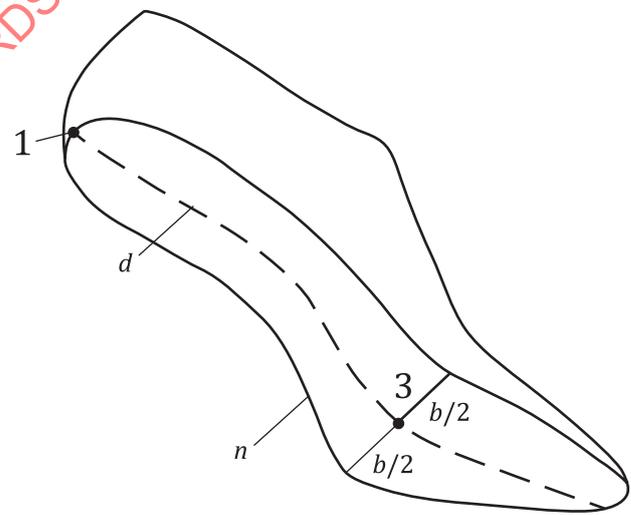


**Key**  
 $l_4$  stick last length

**Figure A.9 — Stick last length**



**a) Central line of last bottom pattern (method 1)**

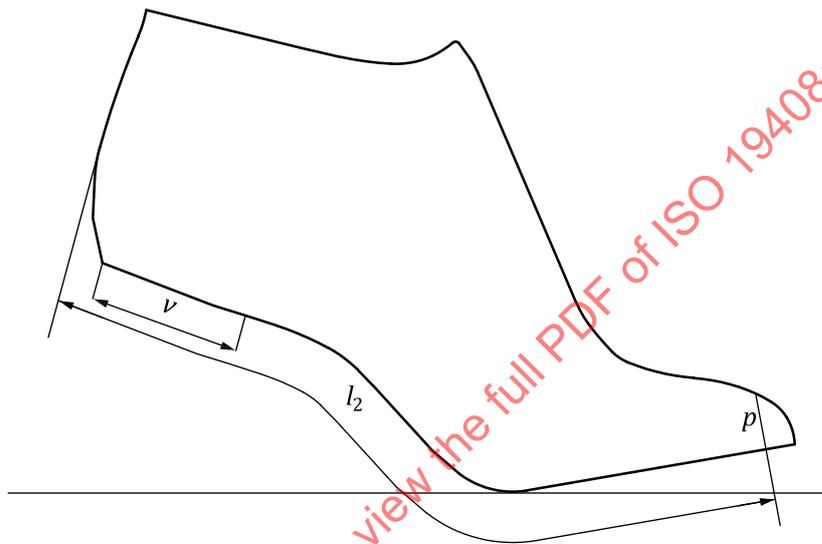


**b) Central line of last bottom pattern (method 2)**

**Key**

- $d$  length of last bottom
- $n$  feather line
- $b$  tread width of last
- 1 heel point at the feather line
- 2 prominent point of the last top at the feather line
- 3 middle point of the tread width

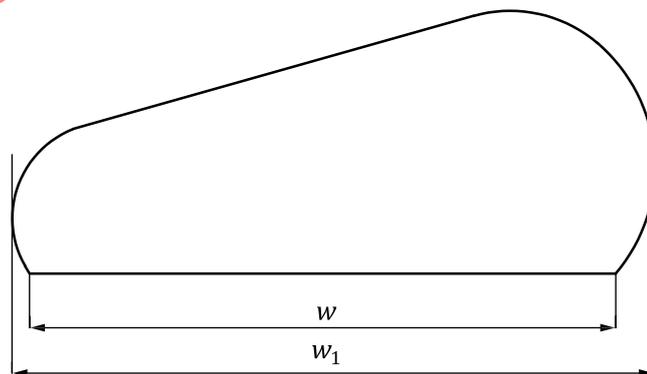
**Figure A.10 — Central line of last bottom pattern**



**Key**

- $v$  heel seat
- $p$  toe height
- $l_2$  effective last length

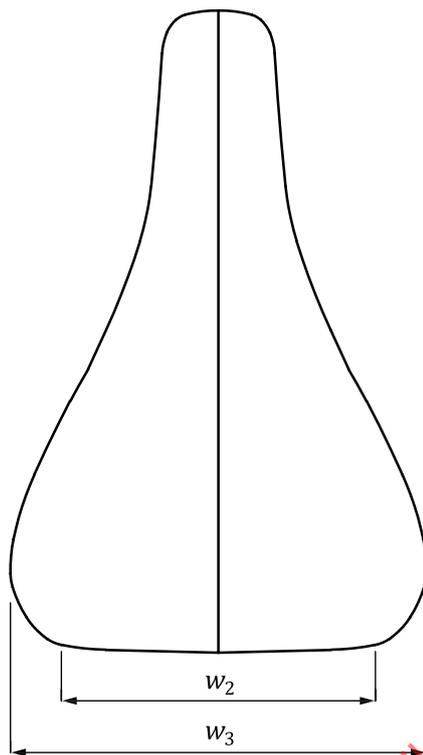
**Figure A.11 — Heel seat of last and toe height**



**Key**

- $w$  tread width of foot or last
- $w_1$  linear width of foot or last

**Figure A.12 — Linear width and tread width of the ball area of foot or last**



**Key**

- $w_2$  tread width of heel
- $w_3$  linear width of heel

**Figure A.13 — Tread width and linear width of heel**

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