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Footwear sizing — In-shoe measurement —

Part 1: Shoe length

Pointures des chaussures — Mesurage interne —

Partie 1: Longueur de la chaussure

Reference number
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Foreword

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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).

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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.

This document was prepared by Technical Committee ISO/TC 137, *Footwear sizing designations and marking systems,* in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 309, *Footwear,* in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

A list of all parts in the ISO 19410 series can be found on the ISO website.

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.

Footwear sizing — In-shoe measurement —

Part 1: Shoe length

1 Scope

This document specifies a method for measuring the effective shoe length to accommodate the foot.

This document is not applicable to heel and toe open shoes (example: sandals).

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

ISO/TS 19407:2015, *Footwear — Sizing — Conversion of sizing systems*

ISO/TS 19408, *Footwear — Sizing — Vocabulary and terminology*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/TS 19407 and ISO/TS 19408 apply.

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/

4 Principle

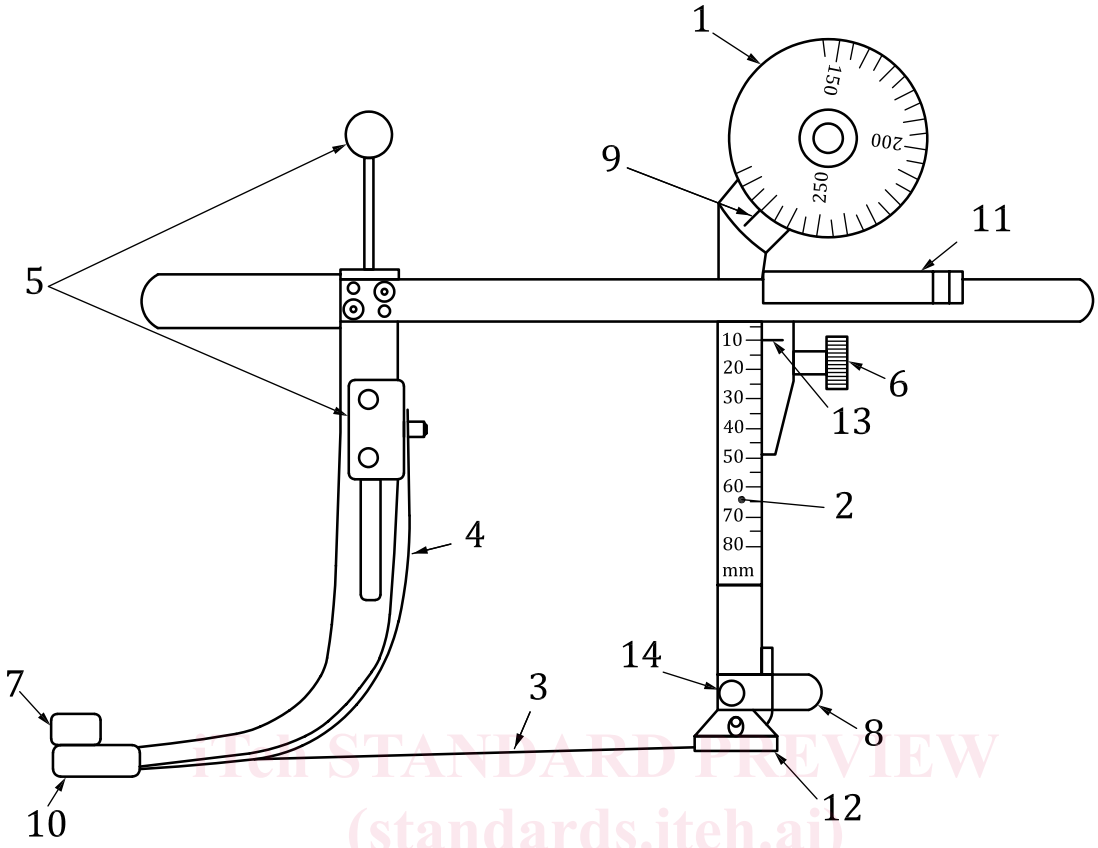
A toe sensor of specified dimensions is inserted into the toe of the footwear and a second sensor located against the inside of the maximum heel swell of the back curve. The distance between the two sensors measured along the insole surface, or close to it, is taken as the effective length of the footwear. The effective length value can be compared with ISO/TS 19407 to determine the nominal shoe size.

5 Apparatus

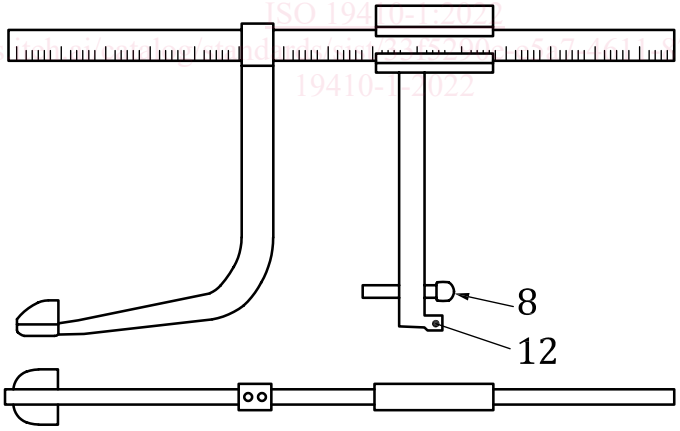
The usual laboratory apparatus and, in particular, the following shall be used.

5.1 Length measurement, comprising a toe sensor, a heel sensor and a means of measuring the distance between them along the insole surface, as illustrated in Figure 1 a). Depending on the size and design of the shoes, the appropriate device can be used.

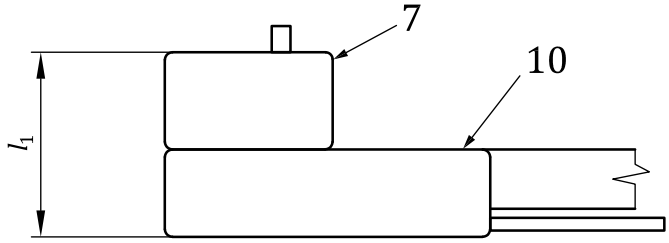
Dimensions in millimetres



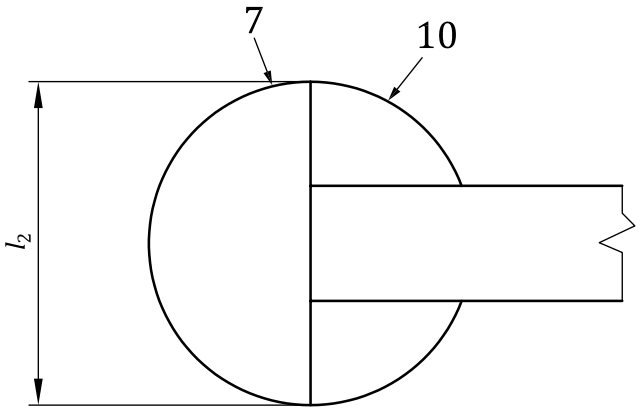
a) Example of length measuring device



b) Example of a simplified length measuring device



c) Toe height sensor with toe height piece – Front view



d) Toe height sensor with toe height piece – Top view

Key

1 length scale
2 heel height scale
3 measuring wire
4 feather to press the wire (key 3) down on insole
5 mechanism to move part (key 4) down onto (key 3)
6 screw to fix part (key 2)
7 replaceable toe height piece
8 heel back curve sensor
9 reading mark calibrated to read effective length (mm)
10 toe sensor (to include height)
11 mechanism to move the heel back curve sensor parts (keys 1, 6, 2 and 8)
12 heel seat sensor
13 reading mark of heel height
14 screw to fix heel back curve sensor (key 8)
l_1 toe height
l_2 width of toe sensor

Figure 1 — Length measuring device

If the footwear to be measured has a heel height <25 mm, then the device may be simplified by removing the measuring wire (key 3) and fixing the heel height scale (key 2) to zero heel height [see example in Figure 1 b)]. At 25 mm, the difference between a linear measure between the toe and heel will not be significantly different from one following the insole surface.

5.1.1 Toe height sensor, defined width, height and shape, specified as in Figures 1 c) and 1 d), to measure the effective shoe length in accordance with ISO/TS 19408.

The height (l_1), including toe sensor (key 10) and replaceable toe height piece (key 7) [see Figure 1 c)] of the toe sensor depends of the marked shoe size (see Table 1). The height of the toe sensor is 20 mm for women and men shoes, for children see Table 1. The foot length results from marked shoe size shall be in accordance with ISO/TS 19407.

Table 1 — Toe sensor height — Children footwear

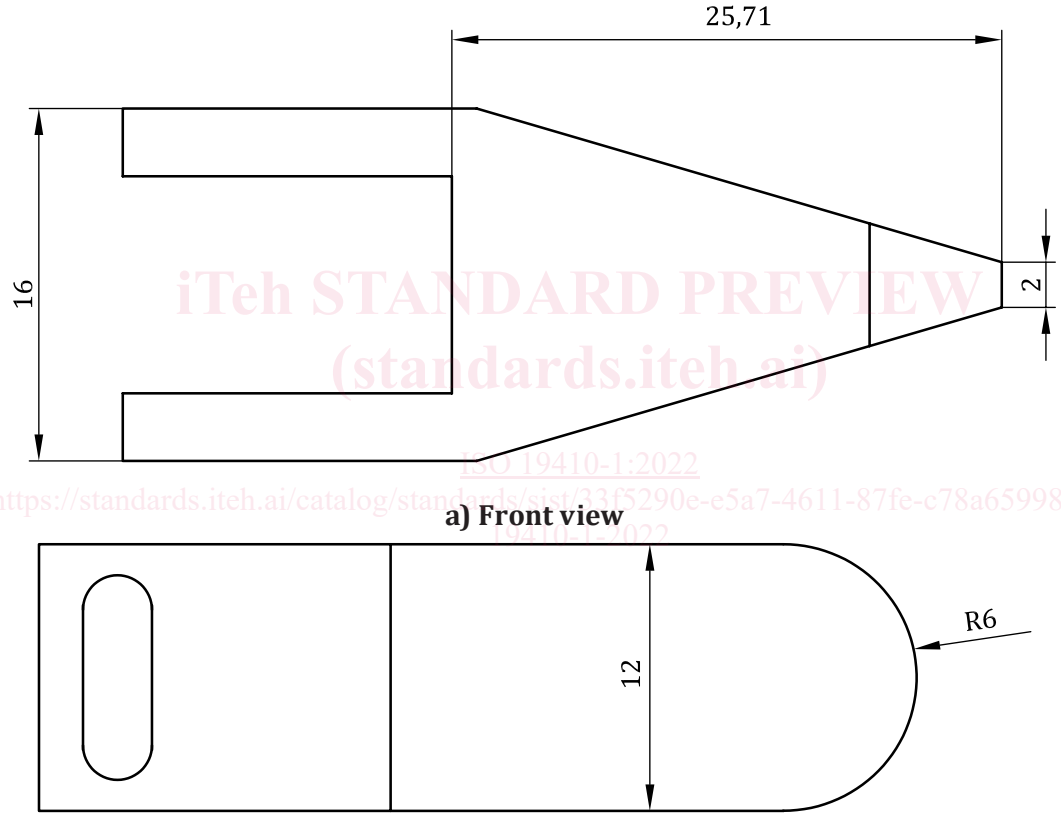
Foot length mm	109 to 132	133 to 156	157 to 175	176 to 195	196 to 215	216 to 241	242 to 255	256 to 268
Toe height mm	13	14	15	16	17	18	19	20

The width (l_2) of the top sensor [see Figure 2 b)] for children footwear up to a foot length of 218 mm is 20 mm, for all other children, women and men footwear, it is 30 mm.

5.1.2 Heel back curve sensor

The heel back curve sensor has the dimensions given in Figure 2.

Dimensions in millimetres



a) Front view

b) Top view

Figure 2 — Details of heel back curve sensor

The device for boots has a longer forepart to bring the toe sensor in the right position. This is necessary for boots without closure elements, for example without shoelaces.

5.2 Ruler (in mm), zero at the edge of the ruler.

6 Sampling

The test pieces are complete footwear including in-socks if applicable. A minimum of one shoe shall be tested for design check. For quality check, a minimum of two pairs of each size shall be tested.

7 Procedure

7.1 Open all closure elements of the footwear, if possible, to make the placement of the device easier.

7.2 Look at the size of the shoe or boot. Select the replaceable toe height piece [see Figure 1 a), key 7], depending of shoe size (see 5.1 and for children, see Table 1) and attach it on toe sensor [see Figure 1 a), key 10].

7.3 Measure the technical heel height of the shoe using the ruler (5.2). Adjust this value at the scale 2 of the measuring device until reading mark of heel height [see Figure 1 a), key 13]. Fix the scale with a screw [see Figure 1 a), key 6].

7.4 Insert the device in the shoe. The heel seat sensor [see Figure 1 a), key 12] shall be placed on the insole. Place the heel back curve sensor [see Figure 1 a) keys 1 and 8] to the correct position of the heel curve maximum, change its height and fix it with a screw [see Figure 1 a), key 14]. Push the toe sensor (see Figure 1, key 10) with a replaceable toe height piece [see Figure 1 a), key 7] without a distortion of the upper into the toe area of the shoe (see Figure 3). Fix the heel back curve sensor part [see Figure 1 a), key 8] using the hand piece mechanism to move the heel back curve sensor parts [see Figure 1 a), key 11]. Do not distort the upper. Check the direction of the toe sensor to be sure that it moves into the shoe top. Press the wire [see Figure 1 a) key 3] down at the shoe insole by using the knob of piece [see Figure 1 a), key 5].

7.5 Read the value of effective shoe length from the scale 1 (accuracy 0,5 mm) at the mark line [see Figure 1 a), key 9].

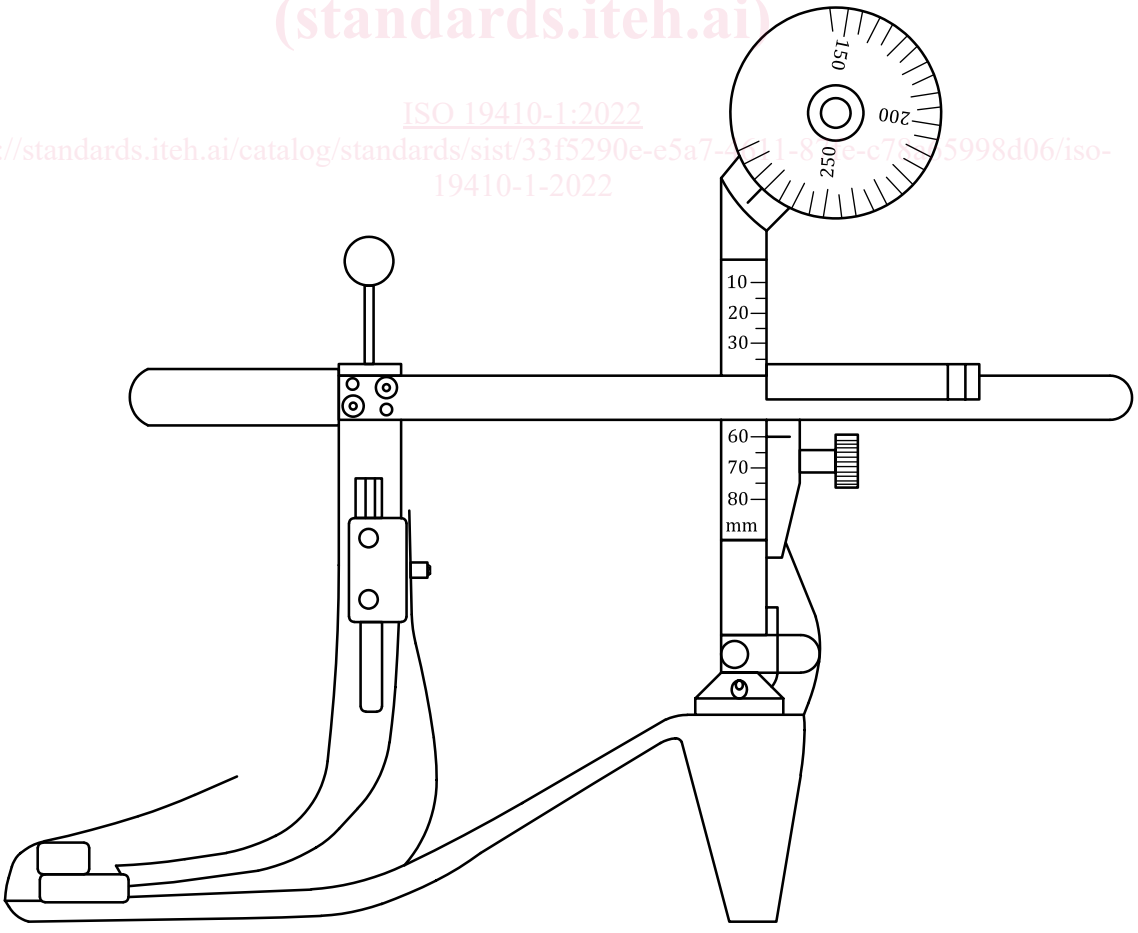
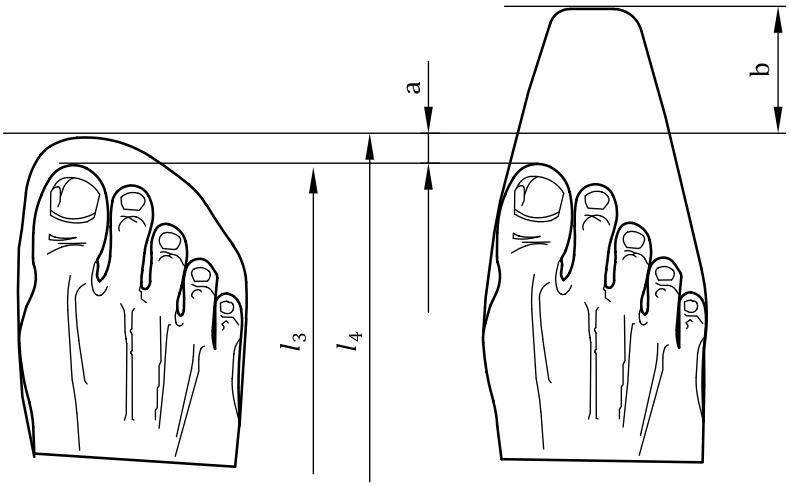


Figure 3 — Placement of device inside of the shoe

8 Result of measurement

Measure the effective shoe length (7.5) and compare with the last length figures as given in ISO/TS 19407:2015, Table 1 or 3 as appropriate, determine and record the predicted shoe size. See Figure 4.



Key

l_3 foot length

l_4 effective shoe length

a Toe allowance.

b Design allowance.

NOTE ISO/TS 19407 gives a range of last lengths for each shoe size marking. For shoe styles with negligible design allowance, e.g. comfort shoes with round and deep toe profiles, the last length will be toward the bottom end of the given range of values.

Figure 4 — Toe allowance and design allowance

9 Test report

The test report shall include at least following:

a) A reference to this document, i.e. ISO 19410-1:2022;

b) All details necessary for complete identification of the samples tested including the number of shoes measured, technical heel height and marked shoe size;

c) Dimensions of the selected toe height;

d) Test results:

- Effective shoe length of each shoe and average (same type and size);
- The corresponding shoe size determined from ISO/TS 19407;
- Comparison of marked shoe size and measured shoe size.

e) Any deviations from the method specified in this document.