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**Alpine ski boots with improved  
walking soles — Interface with alpine  
ski-bindings – Requirements and test  
methods**

*Chaussures de ski pour skis alpins dotées de semelles de marche  
améliorées — Zone de contact avec les fixations de ski alpin —  
Exigences et méthodes d'essai*

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## Introduction

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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](http://www.iso.org/directives)).

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This document was prepared by Technical Committee ISO/TC 83, *Sports and other recreational facilities and equipment*, Subcommittee SC 4, *Snowsports equipment*.

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# Alpine ski boots with improved walking soles — Interface with alpine ski-bindings – Requirements and test methods

## 1 Scope

This document specifies requirements, test methods and marking for alpine ski-boots with improved walking soles that are used with systems of alpine ski-bindings for improved walking soles with attachment at the boot front and boot rear, the proper release function of which depends on the dimensions and design of the interfaces.

Alpine ski boots with improved walking soles are intended to a better walkability without affecting the function of the alpine ski binding designed for improved walking soles.

This document is applicable to ski-boots of sizes 15,0 and larger (Types A (Adults) and C (Children)) in the Mondo point system (see [Annex A](#)).

## 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 527-1, *Plastics — Determination of tensile properties — Part 1: General principles*

ISO 527-2, *Plastics — Determination of tensile properties — Part 2: Test conditions for moulding and extrusion plastics*

ISO 554, *Standard atmospheres for conditioning and/or testing — Specifications*

ISO 868, *Plastics and ebonite — Determination of indentation hardness by means of a durometer (Shore hardness)*

ISO 1183 (all parts), *Plastics — Methods for determining the density and relative density of non-cellular plastics*

ISO 2039-1, *Plastics — Determination of hardness — Part 1: Ball indentation method*

ISO 11088, *Alpine ski/binding/boot (S-B-B) system — Assembly, adjustment and inspection*

ISO 13993, *Rental ski shop practice — Sampling and inspection of complete and incomplete alpine ski-binding-boot systems in rental applications*

## 3 Terms and definitions

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

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

— ISO Online browsing platform: available at <https://www.iso.org/obp>

— IEC Electropedia: available at <http://www.electropedia.org/>

### 3.1

#### interface

part of the ski-boot intended to be in contact with the ski-binding

**3.2**

**front interface**

part of the ski-boot intended to be in contact with the front binding

**3.3**

**rear interface**

part of the ski-boot intended to be in contact with the rear binding

**3.4**

**free space**

space intended to avoid contact between ski-boot and binding, especially during step in/step out or release

**3.5**

**bearing surfaces**

front and rear surfaces of the boot sole that are in contact with the ski binding

**3.6**

**median plane**

middle plane of the sole, longitudinal and perpendicular to the bearing surface

**3.7**

**ski-brake**

device to stop the ski after release of the binding

**3.8**

**walking sole**

sole with hard and soft materials and an optimized profile, intended to a better walkability without affecting the function of the alpine ski binding

**3.9**

**low-friction zone**

area of the bearing surfaces that have a low-friction coefficient

## 4 Requirements and test methods

### 4.1 General

If no specific test method is indicated, check the characteristics as appropriate, e.g. by measurement.

If not otherwise indicated, execute the testing under standard atmosphere 23/50 in accordance with ISO 554 with ordinary tolerances.

A test body for dimensional test of free space to binding is defined in [Annex C](#).

### 4.2 Dimensions and evenness

#### 4.2.1 Dimensions

The boot toe and heel shall conform with [Figure 1](#), [Figure 2](#), [Figure 3](#), [Figure 4](#) and [Figure 5](#).

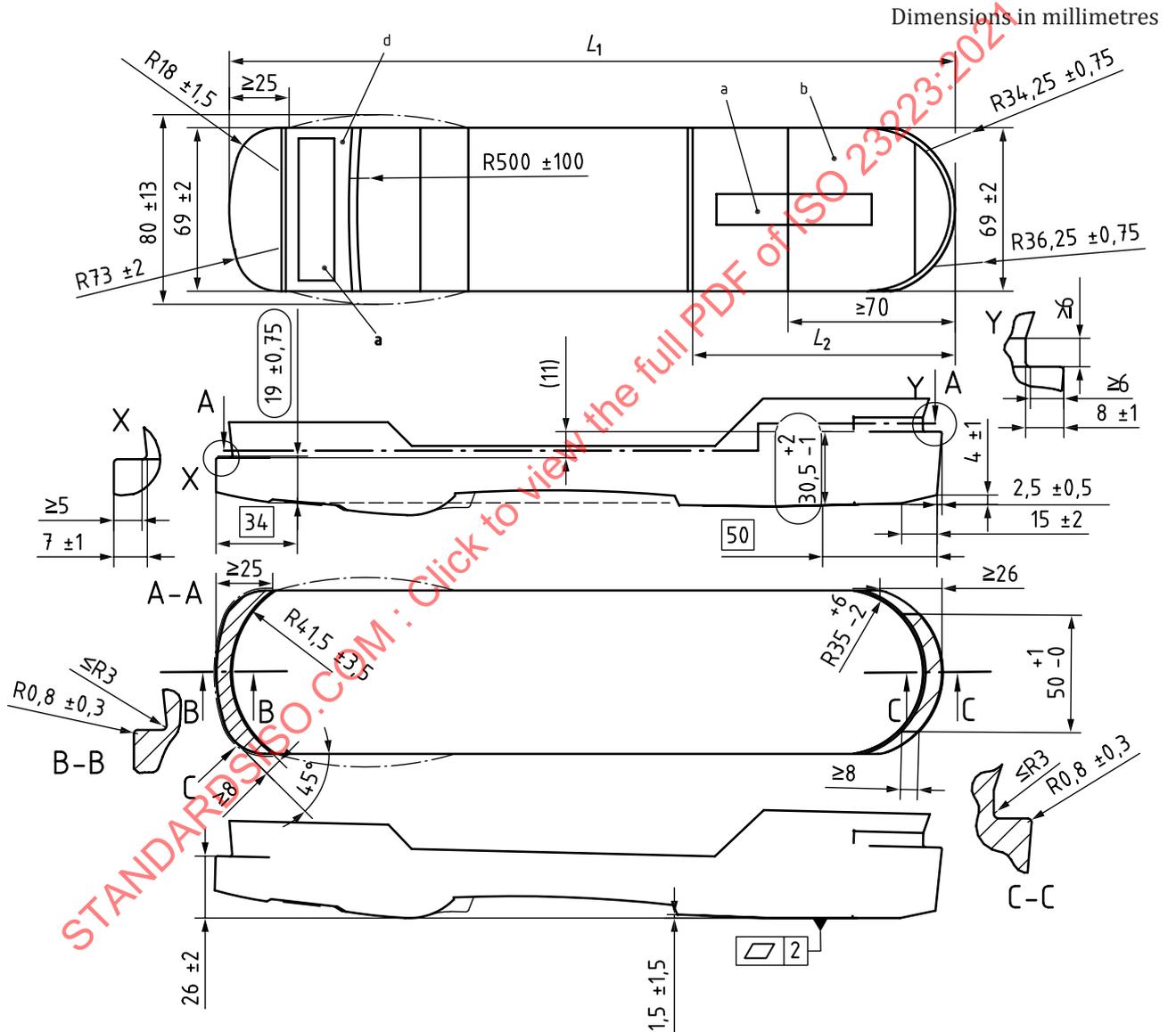
All dimensions shall be within the indicated tolerances. However, relevance to safety varies in importance depending on the indicated dimensions.

Measurements in gauge shall be done with a preload of 100 N and 50 N for Type A and Type C respectively, by inserting into the ski-boot itself a steel cylinder.

Looking at several dimensions (for dimensions of the 2<sup>nd</sup> degree, see [Annex B](#)) a deviation from the tolerances may be accepted, provided that the following requirements are respected:

- a) The deviations shall remain exceptional.
- b) The deviations shall be small.
- c) No limitations of function shall arise with all marketable and critical bindings.
- d) The tolerances shall be respected at the next possible chance (e.g. reconstruction of a tool).

Dimensions for boots with inserts working with pin bindings are given in this document.



$L_1$  sole length

$L_2$  heel length

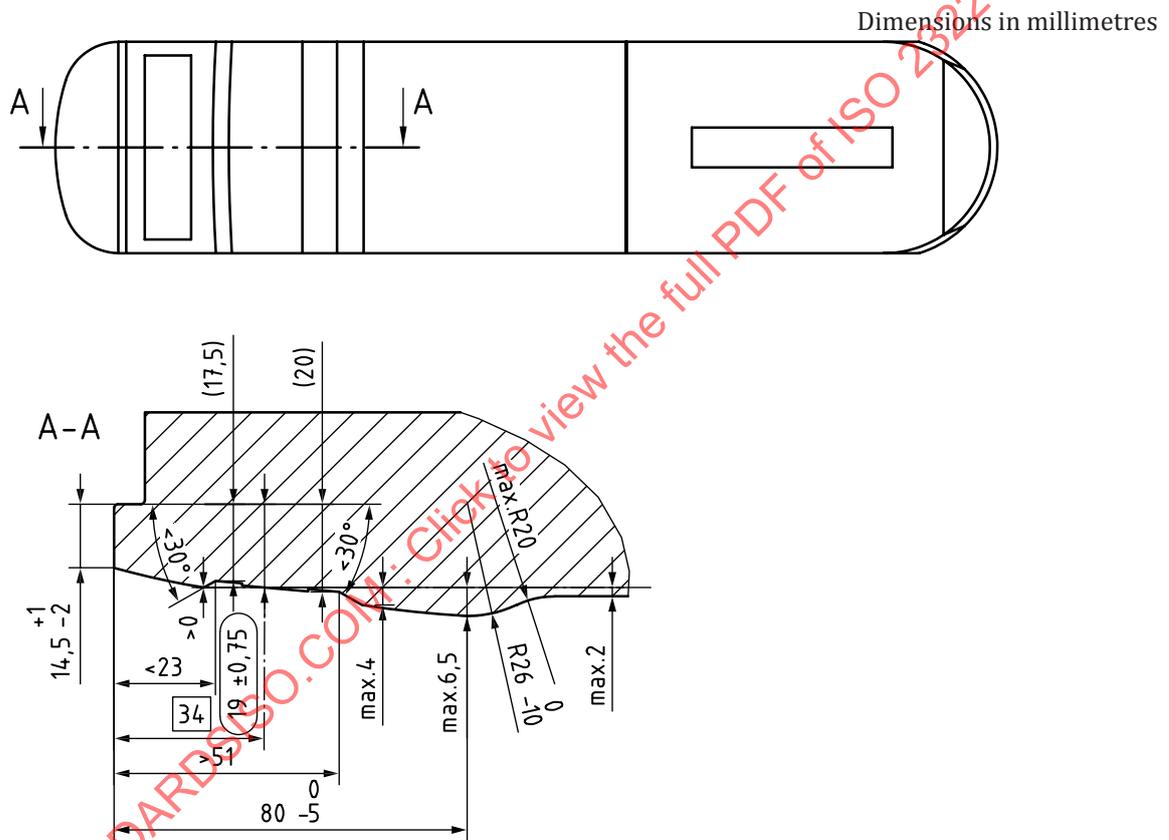
a Low-friction zone in accordance with [4.3.5.1](#).

- b Bearing surface.
- c Area in which the tolerance of perpendicularity is valid (see 4.3.3.1).
- d Section of recessed soft component not in contact with the binding.

|       |            |            |
|-------|------------|------------|
| $L_1$ | <300       | $\geq 300$ |
| $L_2$ | $\geq 100$ | $\geq 110$ |

NOTE Shaded areas including areas with index c are those in which the tolerances of evenness and the dimensions  $19 \pm 0,75$  and  $30,5 +2/-1$  are valid.

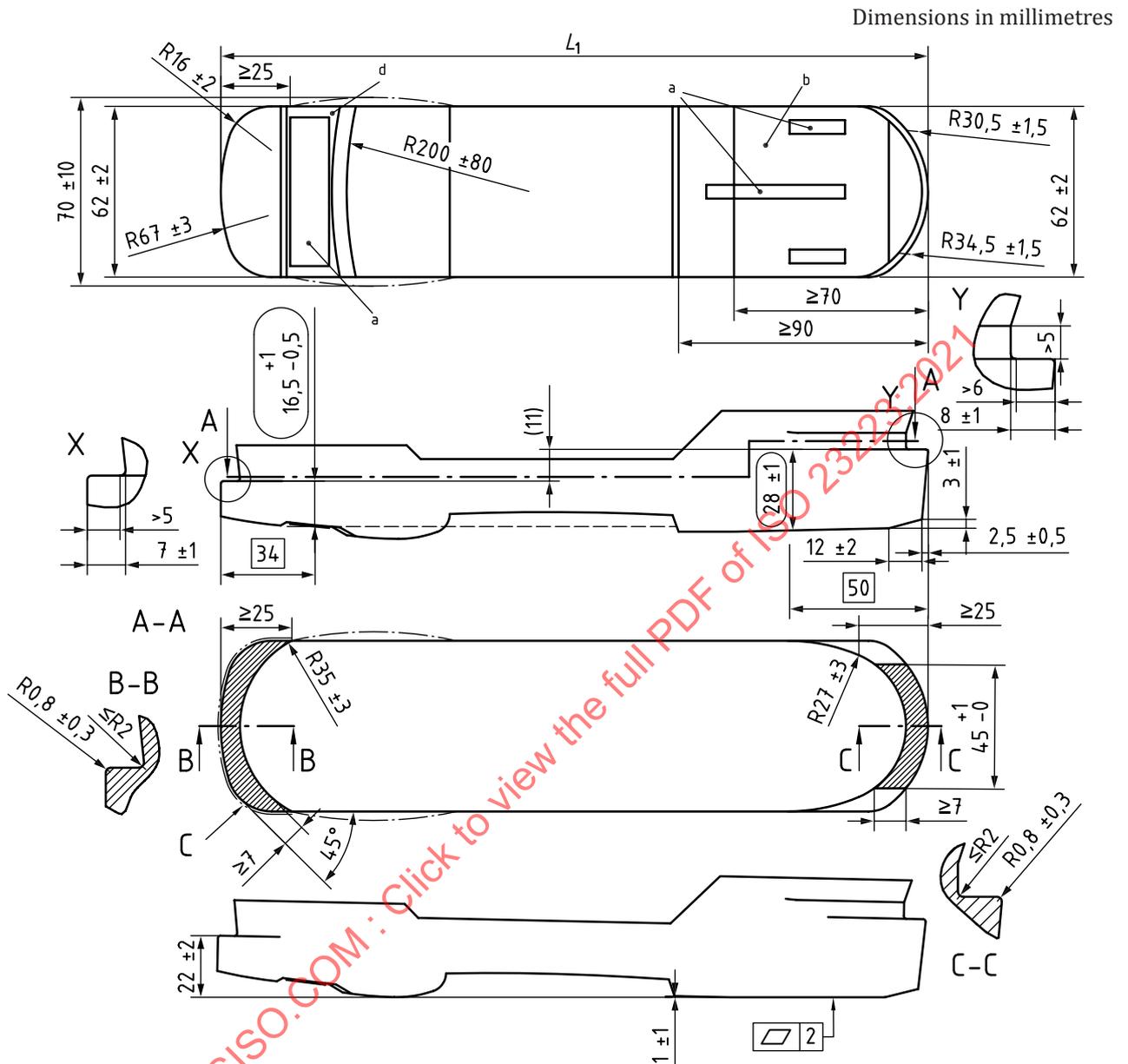
Figure 1 — Dimensions of boot toe and heel, Type A



NOTE Some of these measurements are of 2<sup>nd</sup> degree, see Annex B.

Figure 2 — Detailed dimensions of boot, Type A

Figure 2 provides all the key dimensions (nominal) to build new boots. The gauge (see Annex C) can be used to check whether a boot is in conformity with this document.



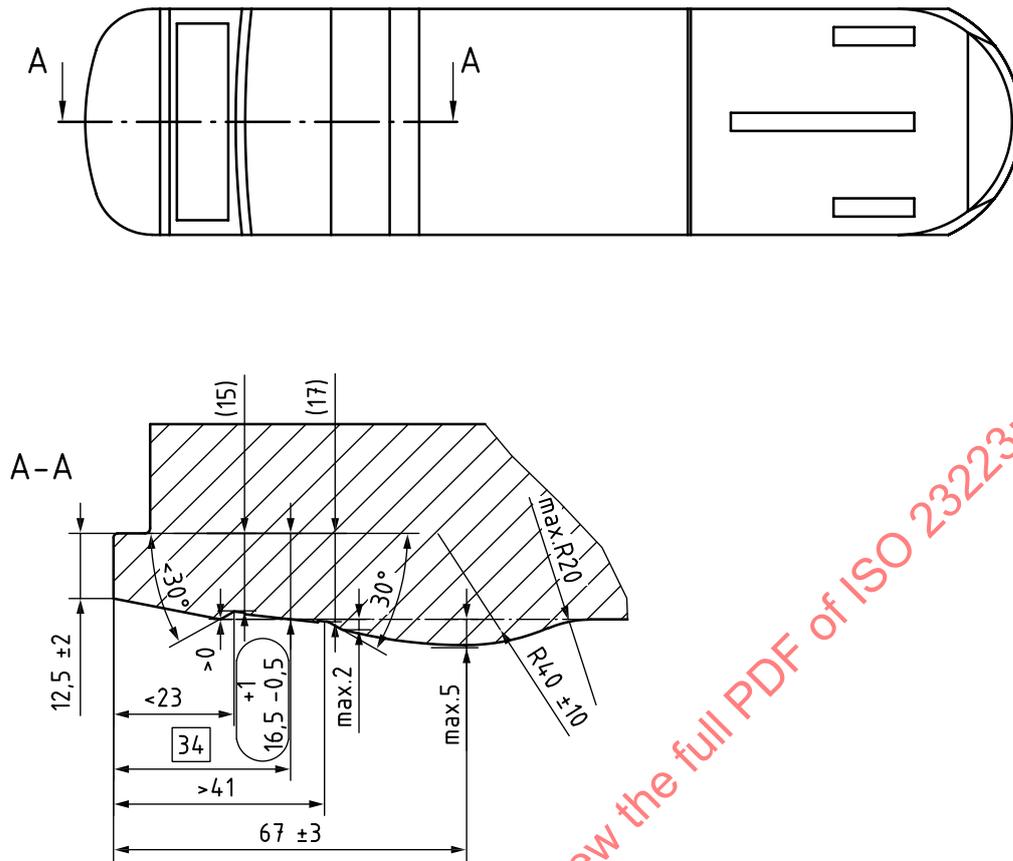
**Key**

- a Low-friction zone in accordance with 4.3.5.1.
  - b Bearing surface.
  - c Area in which the tolerance of perpendicularity is valid (see 4.3.3.1).
  - d Section of recessed soft component not in contact to binding.
- $L_1$  sole length

NOTE Shaded areas, including areas designated by footnote c, are those in which the tolerances of evenness and the dimensions  $16.5^{+1}_{-0.5}$  and  $28 \pm 1$  are valid.

**Figure 3 — Dimensions of boot toe and heel, Type C**

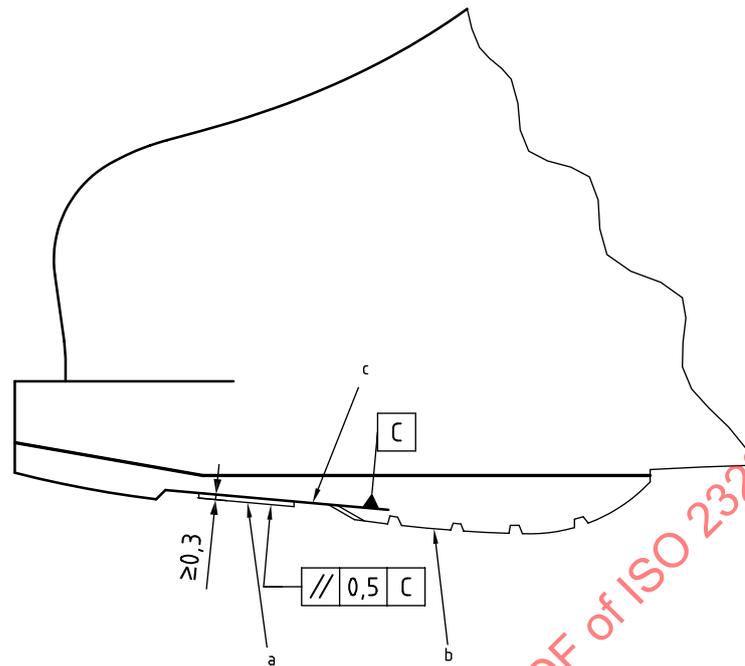
Dimensions in millimetres



NOTE Some of these measurements are of 2<sup>nd</sup> degree, see [Annex B](#).

**Figure 4 — Detailed dimensions of boot, Type C**

[Figure 4](#) provides all the key dimensions (nominal) to build new boots. The gauge (see [Annex C](#)) can be used to check whether a boot is in conformity with this document.

**Key**

- a Low-friction zone with requirement for bearing surfaces in accordance with 4.3.5.
- b Soft component.
- c The soft component in the low-friction zone shall be at least 0,3 mm deeper than the low-friction zone.

**Figure 5 — Toe interface and ski-walk area Type A and Type C**

**4.2.2 Evenness****4.2.2.1 Requirement**

Measurements on each side of median plane shall not differ by more than 0,7 mm for Type A and 0,6 mm for Type C. The preload ( $F$ ) shall be of 100 N and 50 N for Type A and Type C respectively, at a distance ( $L$ ) of 75 mm for Type A and 64 mm for Type C. Apply the preload for minimum 1 minute before the measurement is started.

**4.2.2.2 Test method**

The sample boot shall be placed as described in Figure 6. The x direction is along the boot length and is measured from boot tip or rear, for toe or heel area respectively. Y direction is measured from median plane along boot width. Height shall be measured with an indicator on each side of the median plane (positive and negative y direction).

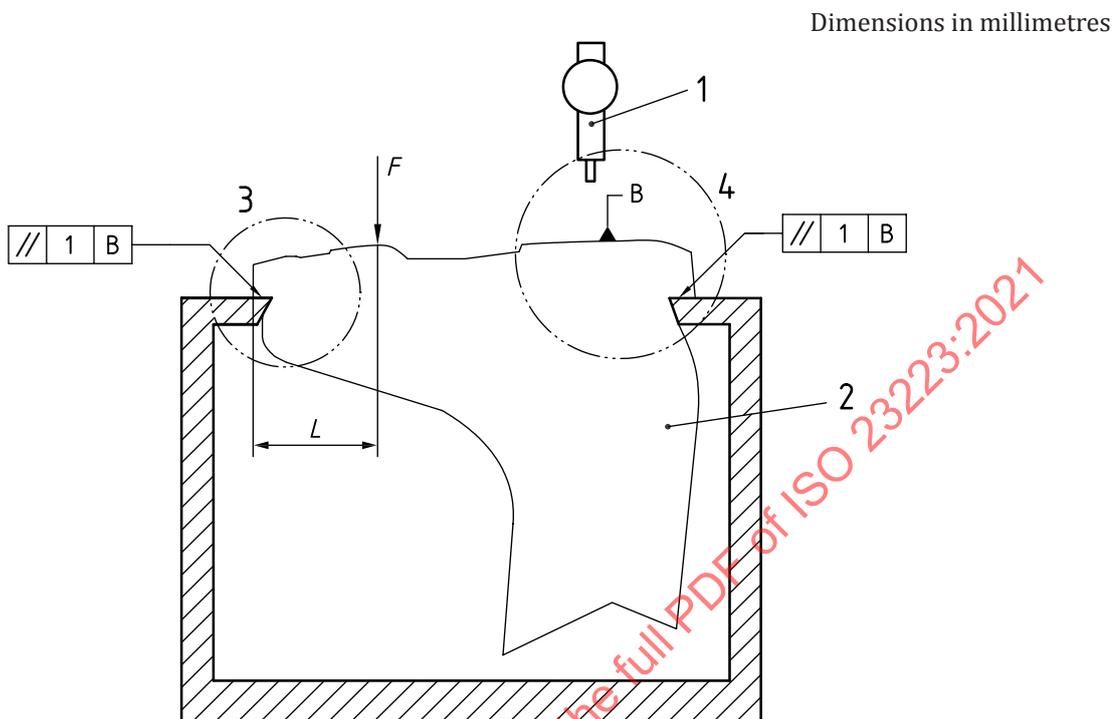
In the toe area the four measurements points are located at

- Type A:  $x = 32$  mm and  $x = 42$  mm with  $y = \pm 25$  mm, see Figure 7, and
- Type C:  $x = 27$  mm and  $x = 37$  mm with  $y = \pm 22$  mm

In the heel area four measurement points shall be selected within 25 mm and 60 mm from the heel, and within

- Type A: 20 mm to 30 mm from the median plane, and
- Type C: 18 mm to 28 mm from the median plane

as shown in the hatched area in [Figure 7](#) (for Type A). The points shall be symmetrical 2 by 2 with respect to the median plane. The points shall be in a zone, which is at the surface of the sole (i.e. not in a notch).



**Key**

- 1 indicator – evenness measurement apparatus
- 2 sample boot
- 3 toe area
- 4 heel area
- $F$  preload
- $L$  distance of preload point

**Figure 6 — Evenness test set up**

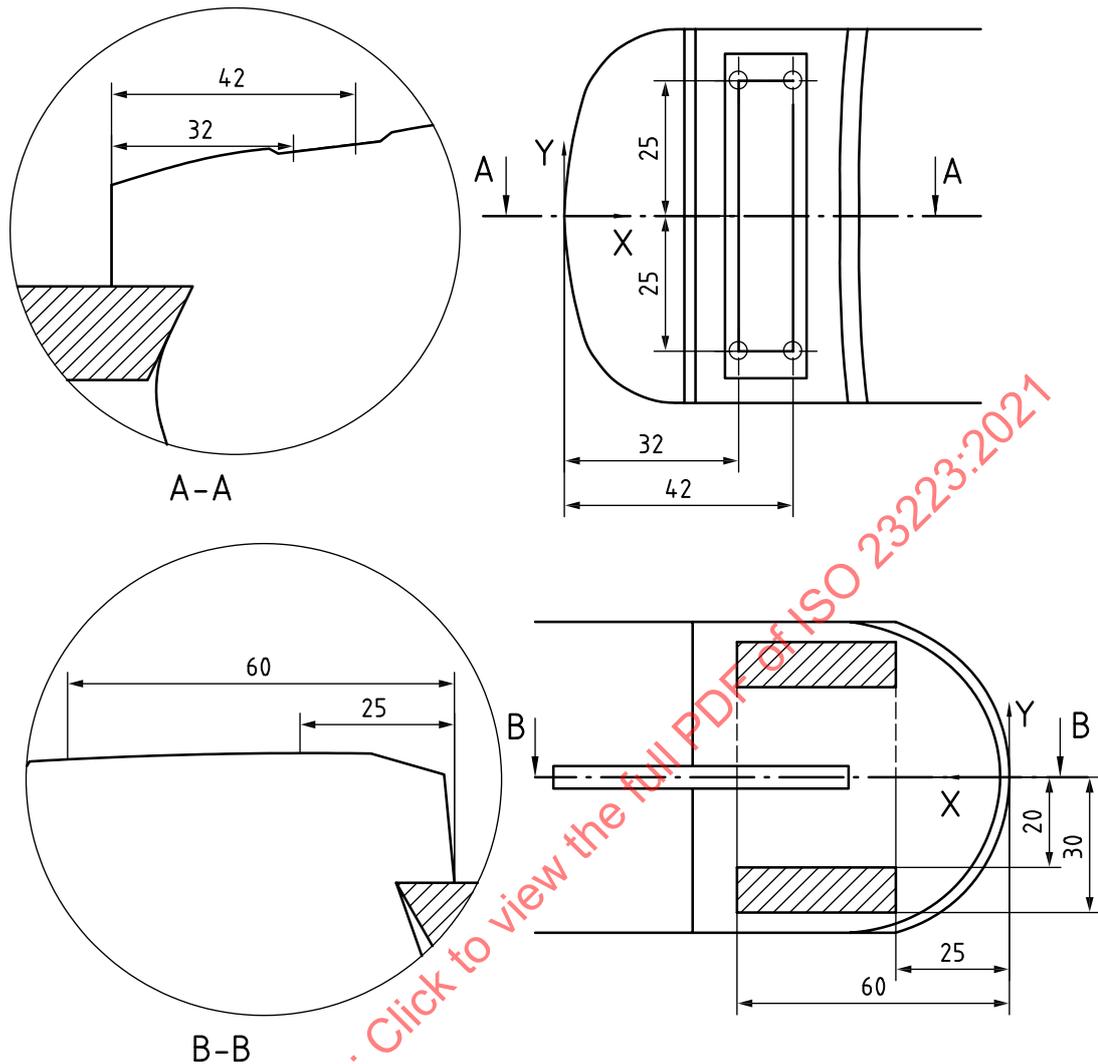


Figure 7 — Evenness test detailed zones for Type A

### 4.3 Design

#### 4.3.1 Sole length

The sole lengths of the two ski-boots in a pair shall not differ by more than 2 mm.

#### 4.3.2 Symmetry

The sole dimensions in the toe and heel interface areas shall be symmetrical about the median plane within an admissible deviation of 1 mm.

#### 4.3.3 Side walls

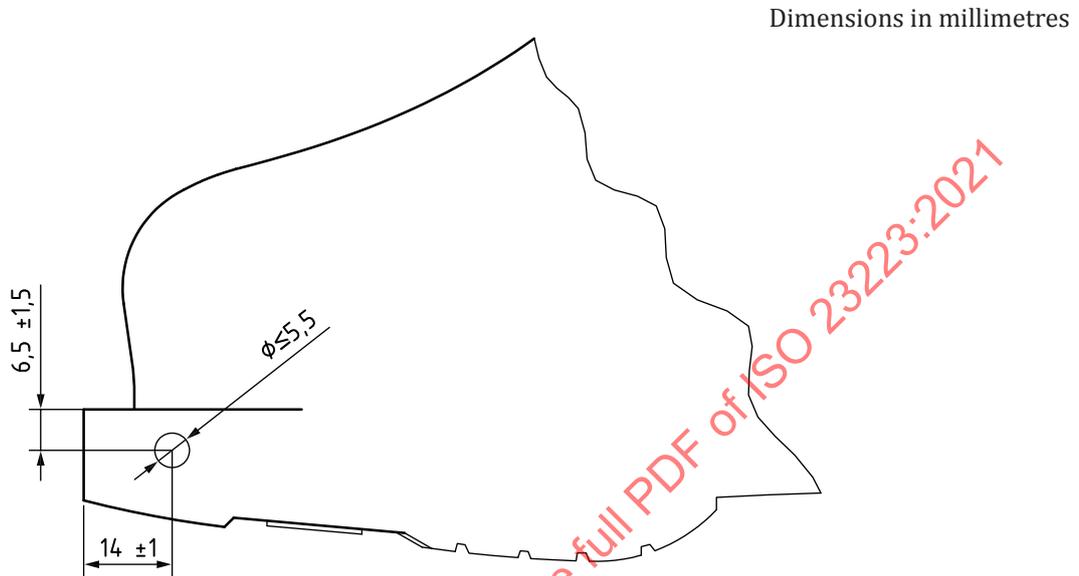
##### 4.3.3.1 Boot front interface

The side walls of the sole at the boot front interface, up to a distance of at least 25 mm from the front end, shall be perpendicular to the bearing surface within an admissible inward — outward deviation of 1 mm.

If the side walls of the sole are built in two parts, it shall be ensured that no part of the lower area of the sole protrudes beyond the upper profile.

Cut-outs in accordance with [Figure 8](#) may be used.

Around the hole, material different from the shell material may be used if it does not protrude outside the shell surface



**Figure 8 — Boot Type A with the position and dimensions of an example for cut outs allowed in the front interface**

#### 4.3.3.2 Boot rear interface

The lateral side walls of the sole at the boot rear interface, up to a distance of at least

- Type A: 70 mm, and
- Type C: 50 mm

from the rear end, shall be perpendicular to the bearing surface, or tapered inwards — outwards between 0° and 10° up to a height of 14 mm.

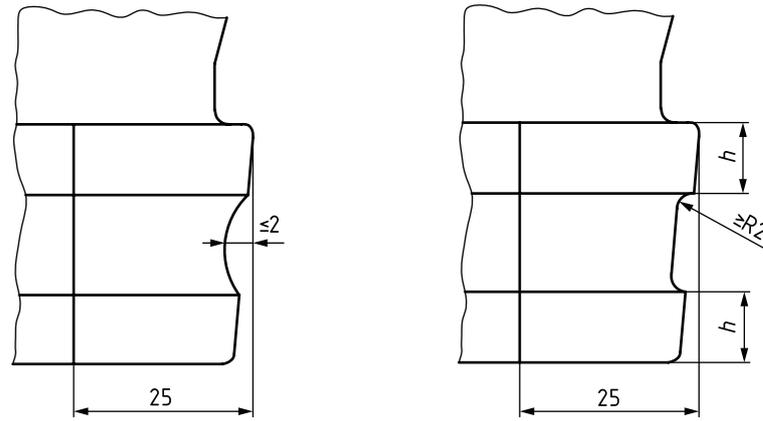
No part of the sole shall project beyond the 10° side wall limitation up to a height of 14 mm, between

- Type A: 70 mm and 85 mm, and
- Type C: 50 mm and 65 mm

If lateral grooves of more than 2 mm depth are present at the heel, see [Figure 9](#), supports that at least confirm with [Figure 10](#) shall remain.

Other configurations of grooves are allowed if they are within dimensions given in [Figure 9](#), [Figure 10](#) and [Figure 11](#).

Dimensions in millimetres

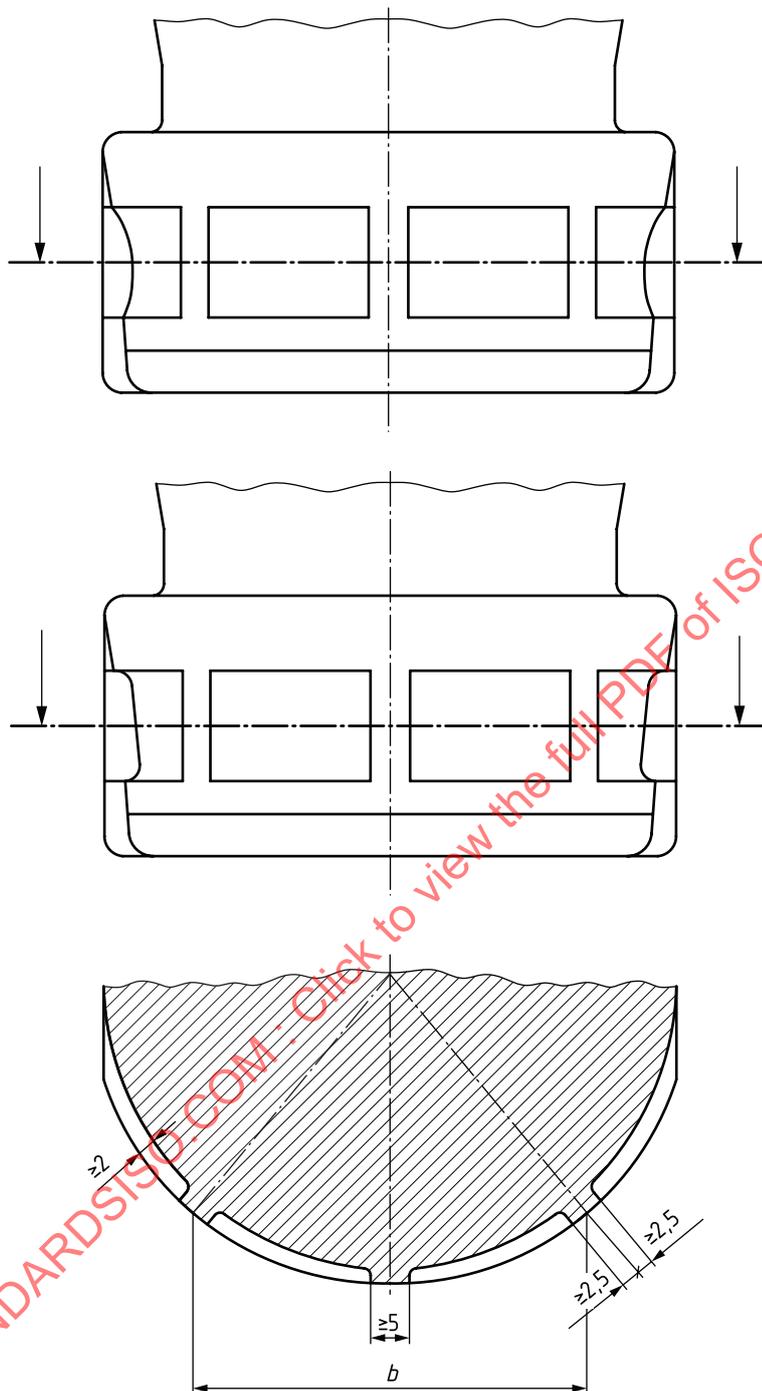


| Dimension | Type A   | Type C   |
|-----------|----------|----------|
| $h$       | $\geq 9$ | $\geq 7$ |

Figure 9 — Lateral grooves at rear

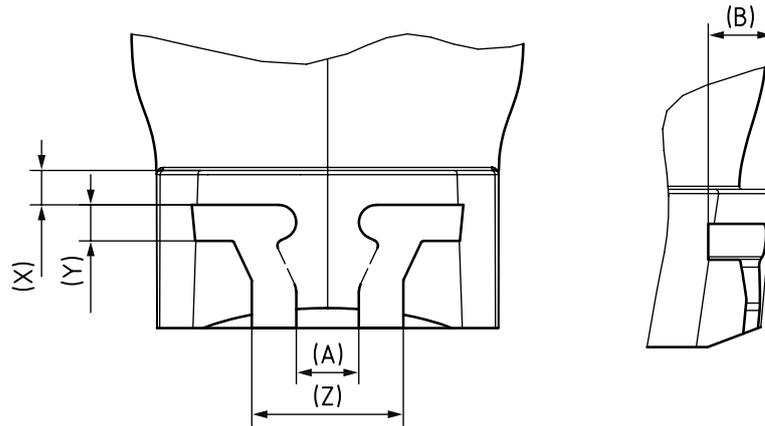
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Dimensions in millimetres



| Dimension | Type A     | Type C     |
|-----------|------------|------------|
| $b$       | $45 \pm 1$ | $40 \pm 1$ |

Figure 10 — Lateral supports at rear

**Key**

- (A) 12,8 mm 0/-1
- (B) 13 mm 0/+2
- (X)  $\geq 6,5$  mm (reinforced by metal)
- (Y)  $(7 \pm 0,5)$  mm
- (Z)  $(25,5 + 6/-0)$  mm

**Figure 11 — Boot Type A with the position and dimensions of an example for cut outs allowed in the rear interface**

#### 4.3.4 Free spaces

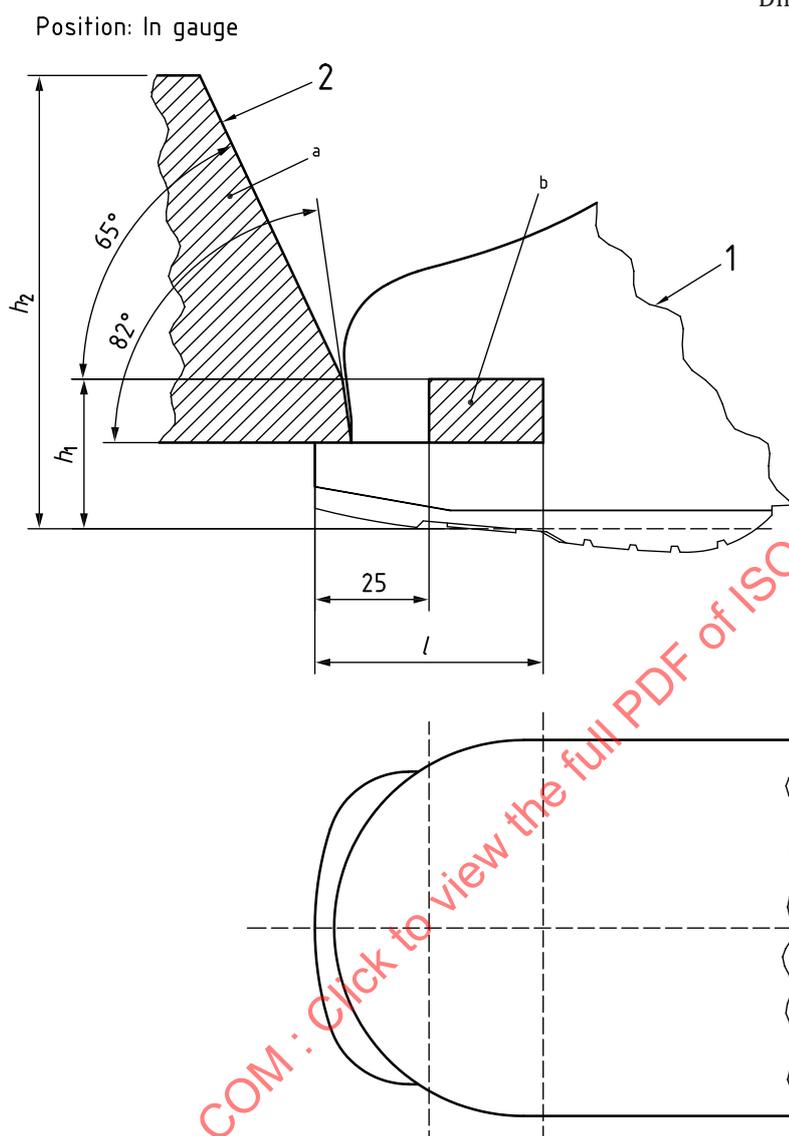
##### 4.3.4.1 Boot toe

###### 4.3.4.1.1 General

The boot shell in the front of the boot along the arcs with a radius of

- Type A:  $(41,5 \pm 3,5)$  mm, and
- Type C:  $(35 \pm 3)$  mm

shall lie outside free space 1, see [Figure 12](#).



| Dimension | Type      |           |
|-----------|-----------|-----------|
|           | A<br>min. | C<br>min. |
| $h_1$     | 33        | 29        |
| $h_2$     | 100       | 80        |
| $l$       | 50        | 44        |

**Key**

- 1 sample boot
- 2 cone
- a Free space 1.
- b Free space 2.

**Figure 12 — Free spaces at boot toe**

Within the free space 2 (see [Figure 12](#)), the arcs with radius of

- Type A: 41,5 mm ± 3,5 mm, and

- Type C: 35 mm  $\pm$  3 mm

(see [Figure 1](#) and [Figure 3](#), section A-A) shall be continued as an arc without discontinuity, providing a smooth transition to the sides of the shaft, between

- Type A: 25 mm and 50 mm, and
- Type C: 25 mm and 44 mm.

This condition is fulfilled when the curvature of the shell within free space 2 remains convex (in accordance with [Figure 13](#)) in both horizontal and vertical planes. However, discontinuities are permitted, provided that they do not hinder the releasing movement of the binding.

Symmetry between both sides of the same boot is not required.

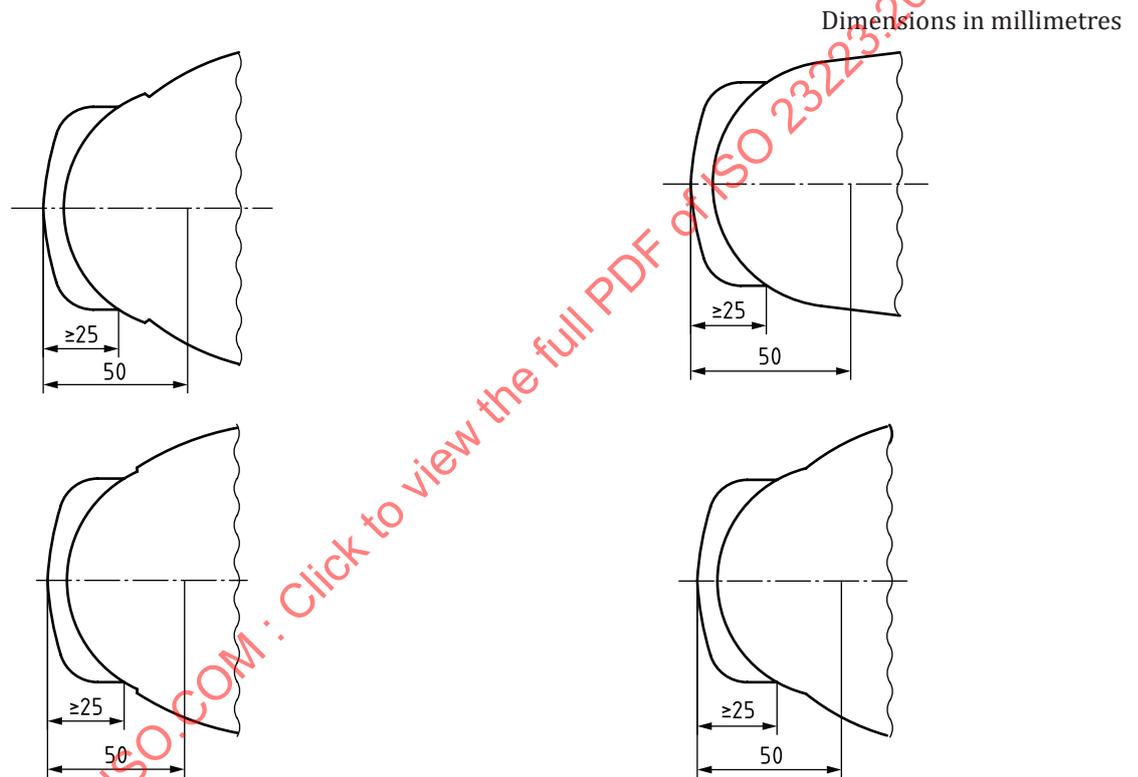


Figure 13 — Curvature of the shaft in free space 2 (examples)

#### 4.3.4.1.2 Test method

Place the boot in the test gauge in accordance with [Annex D](#). Slide the test body (see [Figure 14](#) and [Figure 15](#)) on the plane from the front over the front interface. Check whether the sole height exceeds the maximum value of

- Type A: 19,75 mm, and
- Type C: 17,5 mm

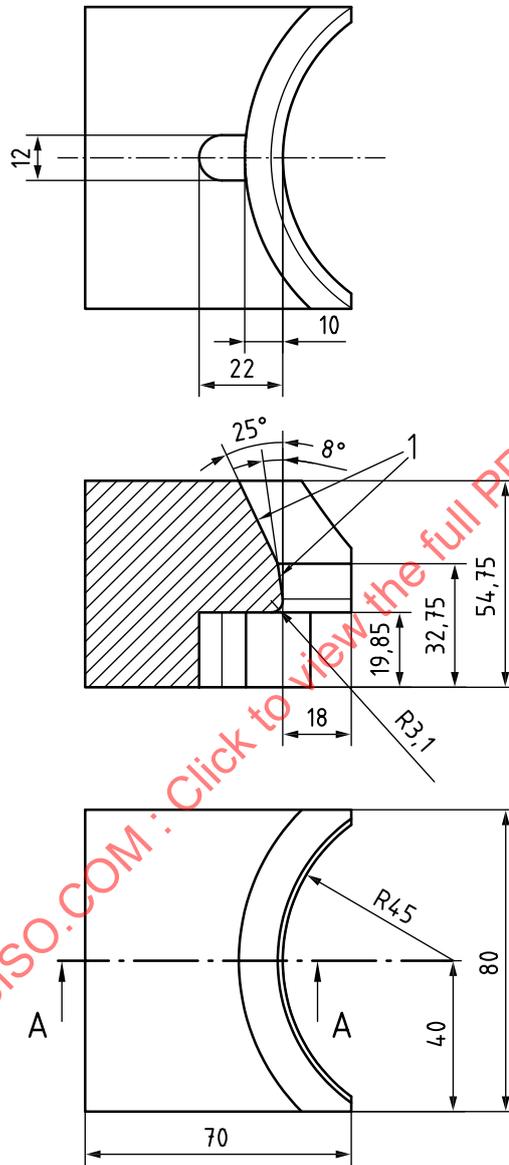
and whether the requirement for free space for the binding is met.

Place the boot sole into the test gauge, bring the upper edge of the boot sole Type A to a height of 19,75 mm by placing distance plates under the low-friction zone of the boot, then test if the free space requirements are met by applying the test body in accordance with [Figure 14](#).

Place the boot sole into the test gauge, bring the upper edge of the boot sole Type C to a height of 17,5 mm by placing distance plates under the low-friction zone of the boot then test if the free space requirements are met by applying the test body in accordance with [Figure 15](#).

This test method is presented as an example, other setups enabling free spaces inspection may be used, as long as they respect the free space specifications from [4.3.4.1](#).

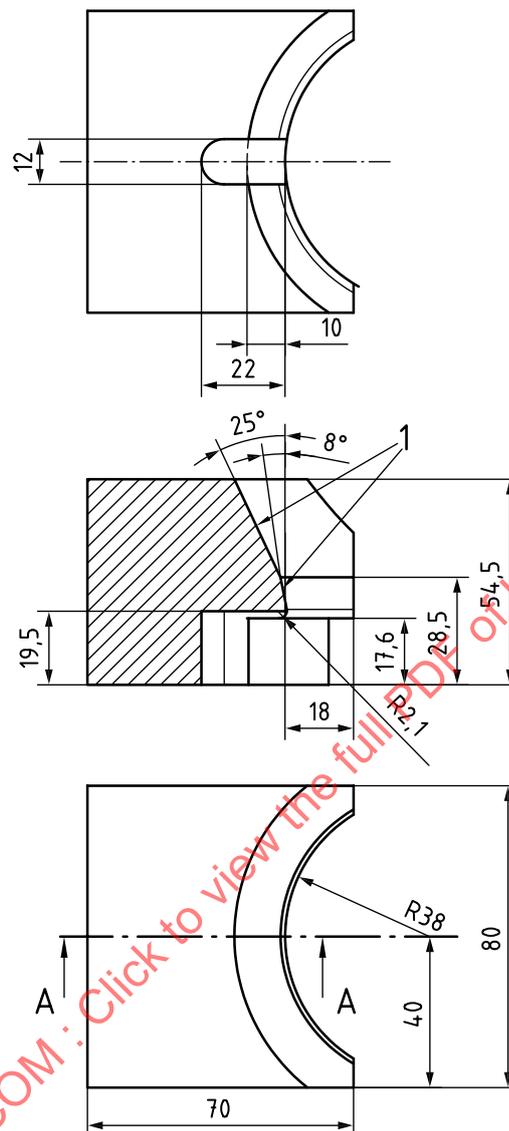
Dimensions in millimetres



Key

- 1 concentric cones

Figure 14 — Test body for the free space at boot toe, Type A



**Key**

- 1 concentric cones

**Figure 15 — Test body for free space at boot toe, Type C**

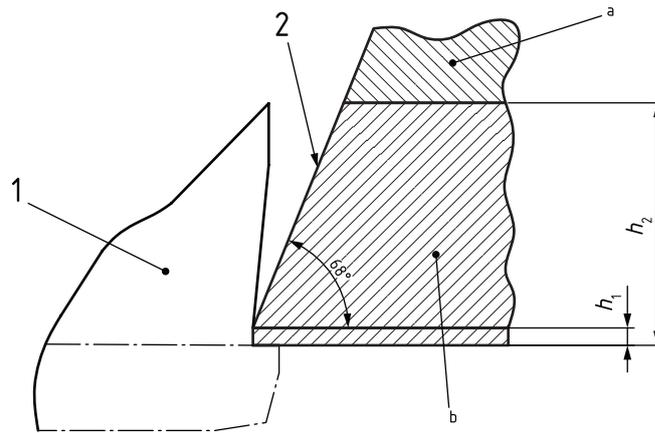
**4.3.4.2 Boot rear**

The boot shell at the rear of the boot along the arcs with radius of

- Type A:  $(35^{+6}_{-2})$  mm, and
- Type C:  $(27 \pm 3)$  mm

shall lie outside free spaces 3 and 4 (see [Figure 16](#)) available for the ski-binding and for handling boot and binding.

Dimensions in millimetres



| Dimension                              | Type   |        |
|--|--------|--------|
|  | A      | C      |
| $h_1$                                  | 6 min. | 5 min. |
| $h_2$                                  | 105    | 90     |
| width, symmetrical to the median plane | 50     | 45     |

**Key**

- 1 sample boot
- 2 cone
- a Free space 3, for handling boot and binding.
- b Free space 4, for ski-binding.

**Figure 16 — Free space and rear interface for ski-binding at boot heel**

**4.3.4.2.1 Test method**

Place the boot with its rear part

- Type A:  $\geq 100$  mm, or
- Type C:  $\geq 80$  mm

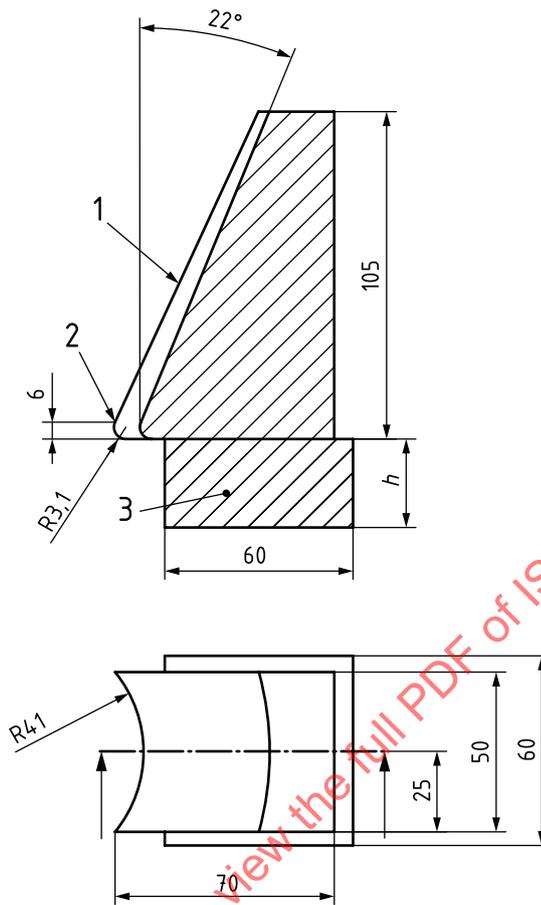
in the test gauge. Set the test body (see [Figure 17](#) and [Figure 18](#)) on a supporting block. By using blocks that correspond to the set value and to the tolerance limits of the rear sole height

- Type A:  $(30,5 + 2/-1)$  mm, or
- Type C:  $(28 \pm 1)$  mm

a check can be made as to whether this dimension is met.

This test method is presented as an example, other setups enabling free spaces inspection may be used, as long as they respect the free space specifications from [4.3.4.2](#).

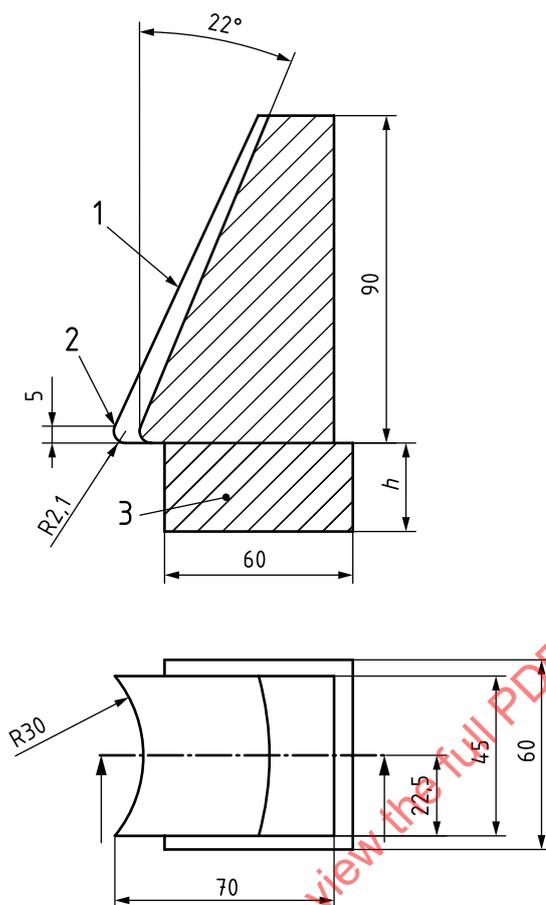
Dimensions in millimetres



**Key**

- 1 cone (concentric with the cylinder)
- 2 cylinder
- 3 supporting blocks where:  
 $h = 29,6$  mm  
 $h = 30,6$  mm  
 $h = 32,6$  mm

**Figure 17 — Test body for free space at rear of boot, Type A**

**Key**

- 1 cone (concentric with the cylinder)
- 2 cylinder
- 3 supporting blocks, where:
  - $h = 27,1$  mm
  - $h = 28,1$  mm
  - $h = 29,1$  mm

**Figure 18 — Test body for free space at rear of boot, Type C**

#### 4.3.5 Bearing surfaces

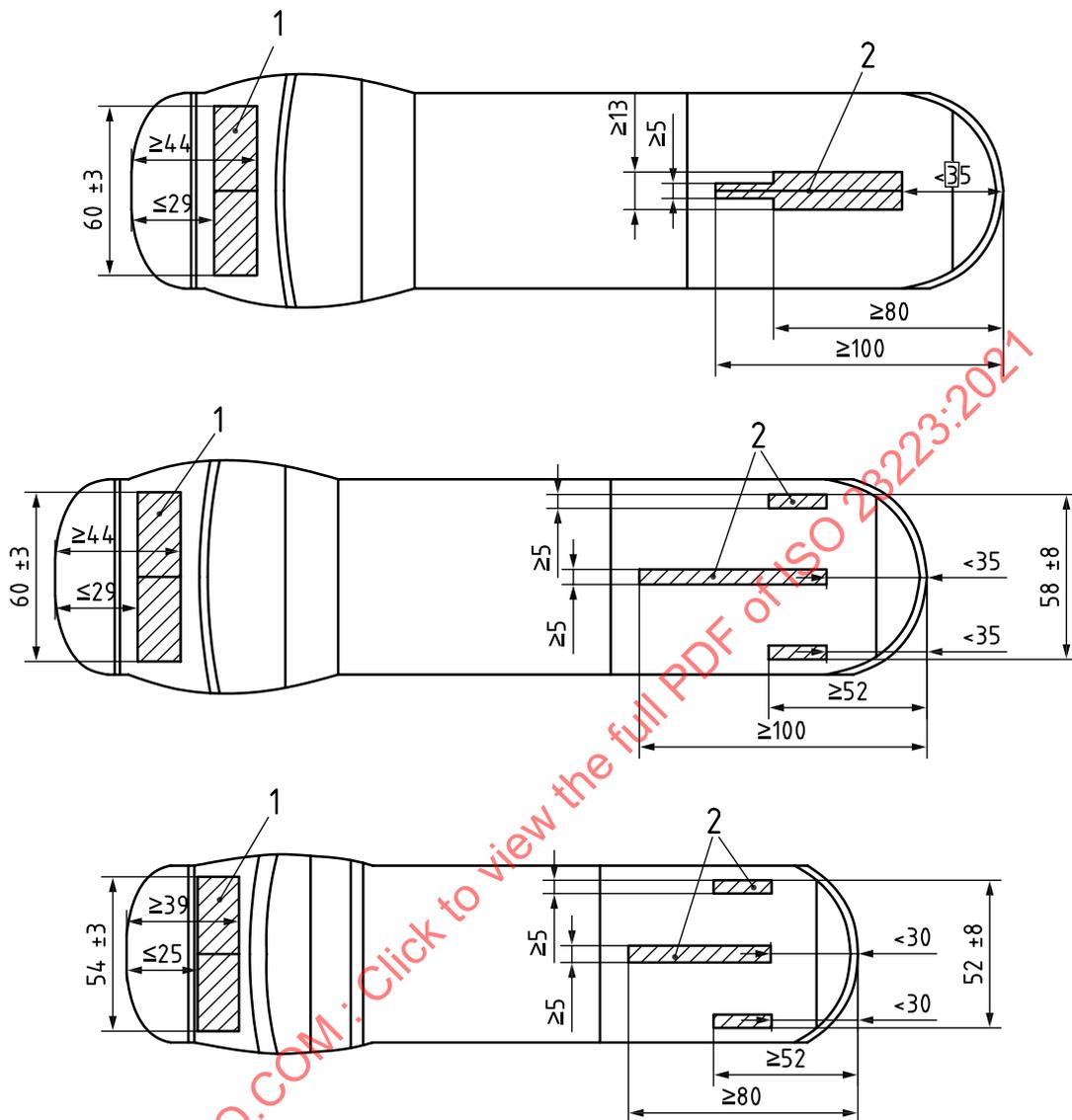
##### 4.3.5.1 Low friction zone dimension

The boot sole interface areas shall conform to [Figure 19](#).

There shall be no gaps  $>1$  mm in the toe interface area (see [Figure 19](#)).

The recess of the soft component compared to the hard component of the heel interface area shall be  $<0,5$  mm.

Dimensions in millimetres

**Key**

- 1 toe low-friction zone and bearing surface
- 2 heel low-friction zone

**Figure 19 — Interface areas****4.3.5.2 Hardness**

The soft component of the sole interface shall have a Shore A hardness of at least 65 and maximum 85. The hard components of the sole interface shall have a minimal hardness of 50 Shore D for both Type A and Type C. Testing of Shore A and D hardness shall be in accordance with ISO 868.

**4.3.5.3 Low-friction zone**

The coefficient of dynamic friction between the toe low-friction zone of the boot (see [Figure 19](#)) and a low friction element of polytetrafluoroethylene (PTFE) shall have a maximum value of 0,10 rounded off to two decimal places. Set up the test in accordance with [Figure 20](#).

The coefficient of dynamic friction between the heel low-friction zone of the boot (see [Figure 19](#)) and a low-friction element of polytetrafluoroethylene (PTFE) shall have a maximum value of 0,15 rounded off to two decimal places. Set up the test in accordance with [Figure 22](#).

#### 4.3.5.3.1 Test method

The coefficient of dynamic friction is determined by the ratio of the force  $F_1$ , which necessary to move a low-friction element over the low-friction zone of the boot, to the test load  $F_2$ , which is applied to the low-friction element.

##### 4.3.5.3.1.1 Test equipment and conditions

The following test equipment and conditions shall be used:

- a) Six sample boots of at least three different sizes, stored for at least 14 days with the last 12 hours of storage before test under standard atmosphere.
- b) Low-friction element, minimum 100 mm long, 15 mm wide, minimum 1 mm thick of peeled polytetrafluoroethylene (PTFE) with the following characteristics:
  - 1) density, in accordance with ISO 1183 (all parts), of  $2,16 \text{ g/cm}^3 \pm 0,02 \text{ g/cm}^3$ ;
  - 2) strength, in accordance with ISO 527-1 and ISO 527-2 but with a specimen in accordance with [Figure 20](#),  $\geq 24 \text{ N/mm}^2$ ;
  - 3) strain at break, in accordance with ISO 527-1 and ISO 527-2 of  $\geq 250 \%$ ;
  - 4) mean ball-indentation hardness, in accordance with ISO 2039-1:  $\geq 26 \text{ N/mm}^2 \pm 4 \text{ N/mm}^2$ ;

The low-friction element may be used for more than 30 measurements until marks of abrasion are visible.

- c) Standard atmosphere: 23/50 or 20/65, in accordance with ISO 554.
- d) Test load  $F_2$ :  
Type A =  $500 \text{ N} \pm 5 \text{ N}$   
Type C =  $300 \text{ N} \pm 5 \text{ N}$
- e) Measuring distance: 8 mm.
- f) Relative speed of the boot to the low-friction element  $1 \text{ mm/s} \pm 0,2 \text{ mm/s}$ .

##### 4.3.5.3.1.2 Procedure

Submit the low-friction element to 10 preliminary measurements, which are not taken into account for the evaluation.

Clean the low-friction zone of the sample boot using neutral soap and hot water, and a soft brush. Allow to dry. After cleaning, the low-friction zone shall be free of grease and soap.

Carry out five measurements, the first of which is ignored, on each sample boot.

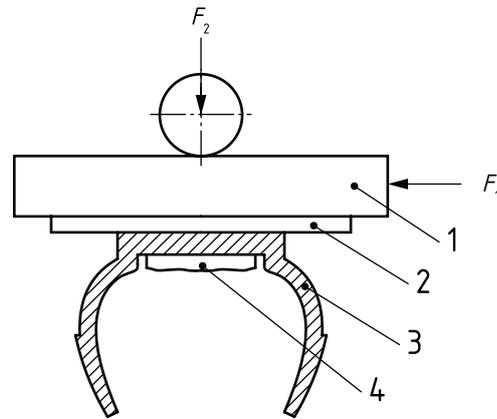
Deformation of the sole greater than 1 mm, which can be avoided by using an appropriate support (see [Figure 20](#)), is not permitted.

The measurement error for the four significant measurements shall not exceed  $\pm 5 \%$ .

Clean the low-friction element before measuring the next sample boot by rubbing with a clean soft cloth. After cleaning, the low-friction element shall be free of grease.

Determine the coefficient of dynamic friction by taking the mean value of the 24 measurements (6 boots  $\times$  4 measurements each).

Dimensions in millimetres



#### Key

- 1 low-friction element support
- 2 low-friction element
- 3 sample boot
- 4 support to prevent boot deformation
- $F_1$  measuring force
- $F_2$  test load

Figure 20 — Coefficient of dynamic friction test

#### 4.3.5.4 Heel bearing surface

##### 4.3.5.4.1 General

The bearing surface at the heel shall satisfy the following requirements:

- a) it shall be suitable for closing the heel part and it shall allow longitudinal travel of the binding;
- b) it shall provide a correct fit on the bearing plate of the binding;
- c) there shall be no hindrance to sideways movement of the sole if the binding is released;
- d) there shall be no interference with proper functioning of ski-brakes.

##### 4.3.5.4.2 Penetration test

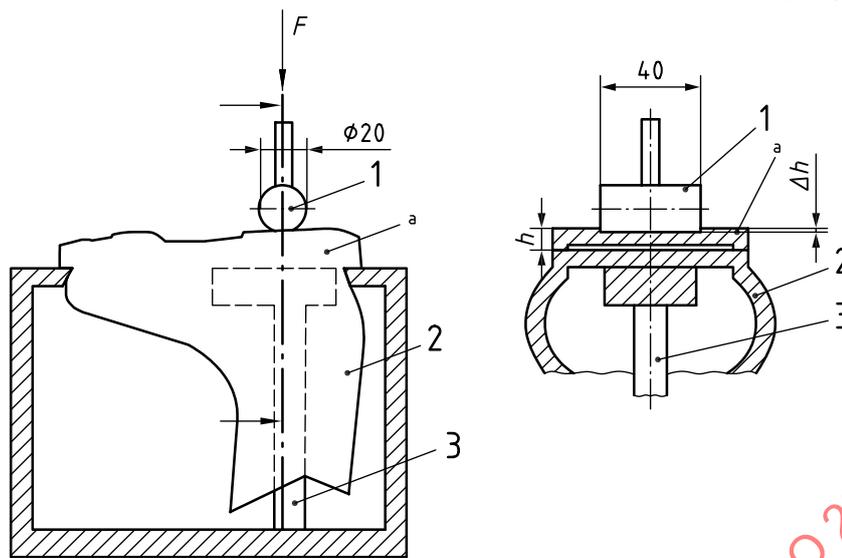
Bring a steel test cylinder, length 40 mm and diameter 20 mm, onto the heel bearing surface, set the zero with unloaded cylinder and apply load of

- Type A: 400 N, or
- Type C: 250 N perpendicular to the boot, see [Figure 21](#).

After 60 s, the cylinder shall not have penetrated the surface more than 2,5 mm.

The test shall be done in bearing area b, see [Figure 1](#) and [Figure 3](#).

Dimensions in millimetres



**Key**

- 1 test cylinder
- 2 sample boot
- 3 support to avoid sole bending
- $F$  test load
- a Heel bearing surface.

**Figure 21 — Penetration test**

**4.3.5.4.2.1 Cylinder test**

- a) Correct fit requirement

Move a steel test cylinder of 10 mm diameter and 20 mm length within the peripheral zone of

- Type A: 13 mm, or
- Type C: 10 mm.

The test shall not reveal a variation in height greater than 1,5 mm in the longitudinal axis of the boot. There shall be no hindrance to sideways movement.

- b) Proper functioning requirement on ski brakes

Move a steel test cylinder of 5 mm diameter and of length greater than the breadth of the sole along the longitudinal axis of the boot and later, a test cylinder of 5 mm diameter and a length of 35 mm in the area between

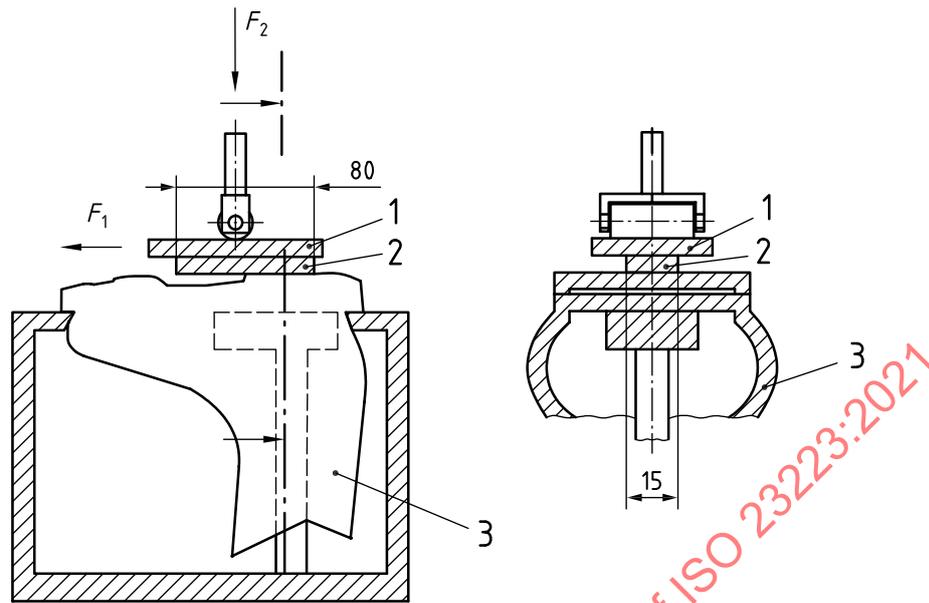
- Type A: 35 mm and the value of length 100, see [Figure 1](#), and
- Type C: 30 mm and the value of length 80, see [Figure 3](#)

from the heel end. Both tests shall not reveal a variation in height greater than 1,5 mm along this axis.

**4.3.5.4.2.2 Low-friction test of the heel interface area**

The coefficient of dynamic friction between the low-friction zone of the heel interface area and a low-friction element of polytetrafluoroethylene (PTFE) shall be tested in accordance with [Figure 22](#).

Dimensions in millimetres

**Key**

- 1 support of low-friction element
- 2 low-friction element [same characteristics as [4.3.5.3.1.1 b\)](#) except wide and long dimensions which are respectively 15 mm and 80 mm]
- 3 sample boot
- $F_1$  measuring force
- $F_2$  test load

**Figure 22 — Low-friction test****4.3.5.5 Toe bearing surface****4.3.5.5.1 General**

The bearing surface at the toe shall satisfy the following requirements:

- a) it shall provide a correct fit on the bearing plate of the binding;
- b) there shall be no hindrance to sideways movement of the sole if the binding releases.

**4.3.5.5.2 Penetration test**

The penetration test shall be performed in accordance with [4.3.5.4.2](#).

**4.3.5.6 Rigidity****4.3.5.6.1 General**

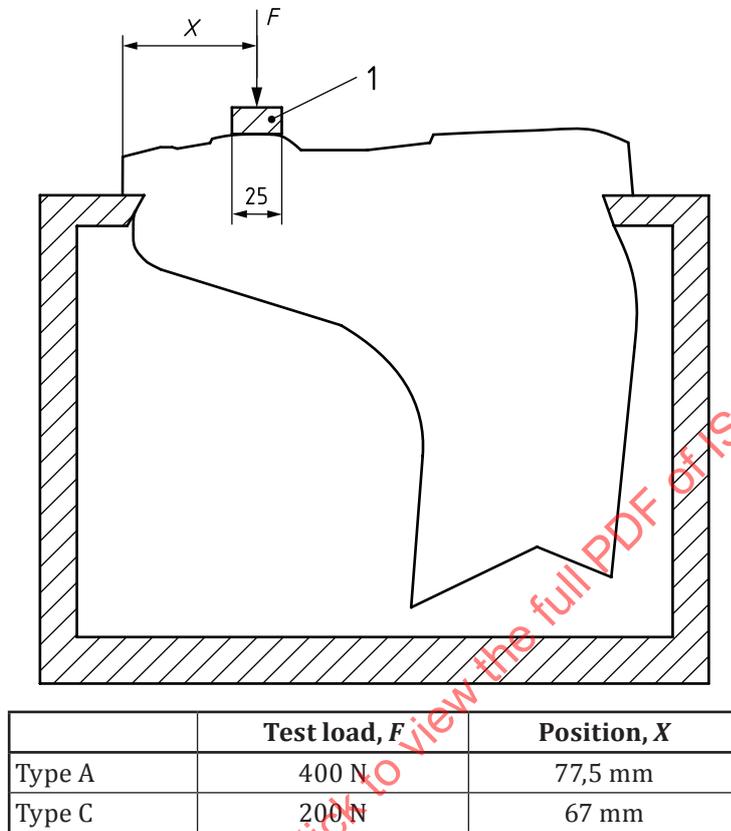
When measured in accordance with [4.3.5.6.2](#), the sole shall not deflect more than 5 mm.

NOTE This is to avoid any contact point outside the frontal zone and the boot sole interface area (see [Figure 19](#)) in order to ensure proper lateral release function.

4.3.5.6.2 Test method

The rigid test bar (width 25 mm) shall cover the whole width of the sole and a preload shall be applied in accordance with [Figure 23](#).

Dimensions in millimetres



Key

- 1 rigid metal test bar
- $F$  preload
- $X$  position

Figure 23 — Rigidity test

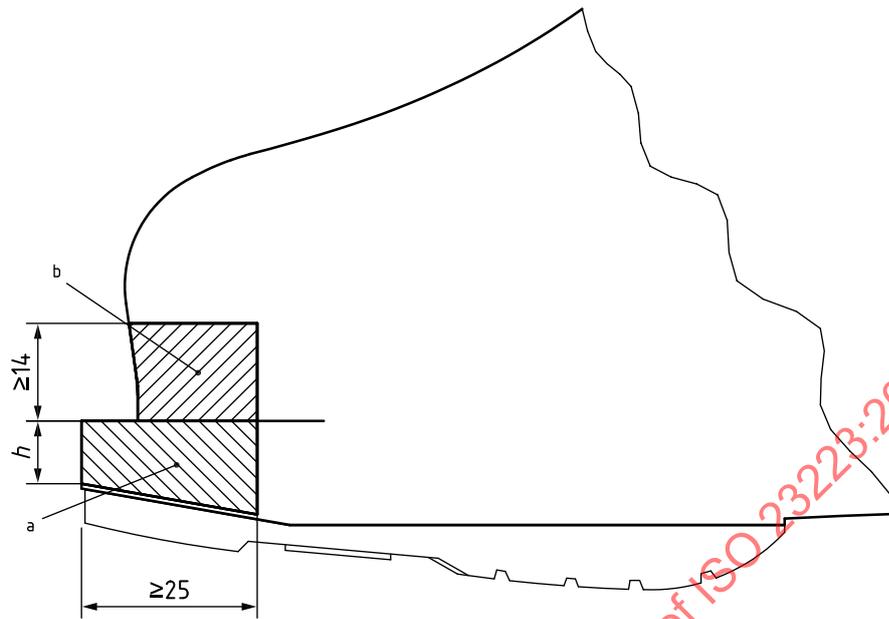
4.3.6 Interfaces

4.3.6.1 Front interface

At the front interface (see [Figure 24](#)),

- a) no material in the sole shall protrude perpendicular to the vertical surfaces;
- b) the profile of the shell in the 82° to 90° space can be straight or convex in any vertical plane providing the profile stays within the 82° to 90° limit.

Dimensions in millimetres



| Dimension | Type   |        |
|-----------|--------|--------|
|           | A      | C      |
| <i>h</i>  | 9 min. | 7 min. |

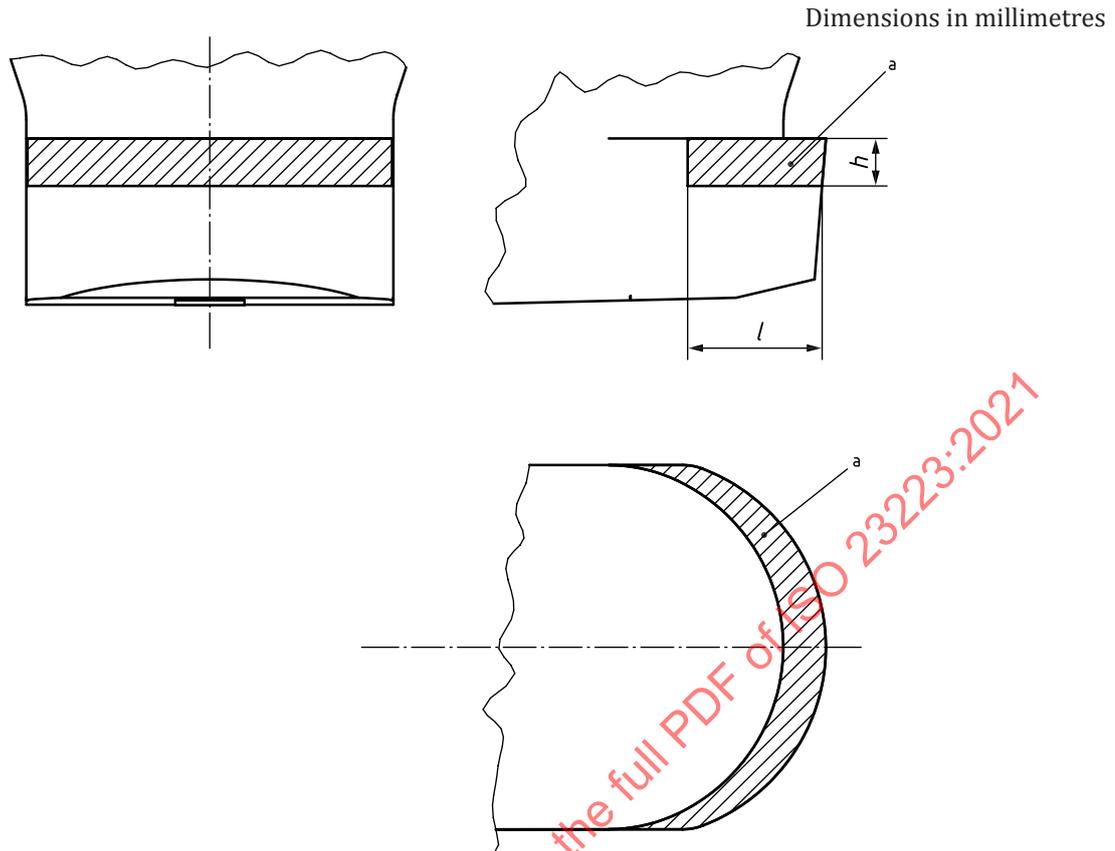
**Key**

- a Front interface sole.
- b Front interface shell.

**Figure 24 — Front interface**

**4.3.6.2 Rear interface**

The rear interface is defined in [Figure 25](#).



| Dimensions | Type    |         |
|------------|---------|---------|
|            | A       | C       |
| <i>l</i>   | 26 min. | 25 min. |
| <i>h</i>   | 9 min.  | 7 min   |

**Key**

<sup>a</sup> Rear interface.

**Figure 25 — Rear interface area**

**4.3.6.3 Hardness**

The hardness of the material at the front and rear interface areas for adult boots Type A (see [Figure 24](#) and [Figure 25](#)) shall not be less than Shore D hardness 50, measured at a temperature of (23 ± 2) °C.

The hardness of the binding interface (see [Figure 24](#) and [Figure 25](#)) for children's boots Type C shall not be less than Shore D hardness 45.

Testing of Shore D hardness shall be in accordance with ISO 868.

**4.3.6.4 Antifriction**

**4.3.6.4.1 General**

The coefficient of dynamic friction at the front (see [Figure 24](#)) and rear interfaces (see [Figure 25](#)) between the boot material and a low-friction element of polytetrafluoroethylene (PTFE) shall be ≤0,1;

If the material is identical to the material of the low-friction zone, no testing is necessary.

If the materials are different, test in accordance with [4.3.6.4.1](#).

#### 4.3.6.4.2 Test method

Inject a test specimen in the form of a plate (dimensions greater than or equal to low-friction zone) of the diverging material.

Test the coefficient of friction in accordance with [4.3.5.3.1](#).

#### 4.3.6.5 Locking mechanism of the adjustment device

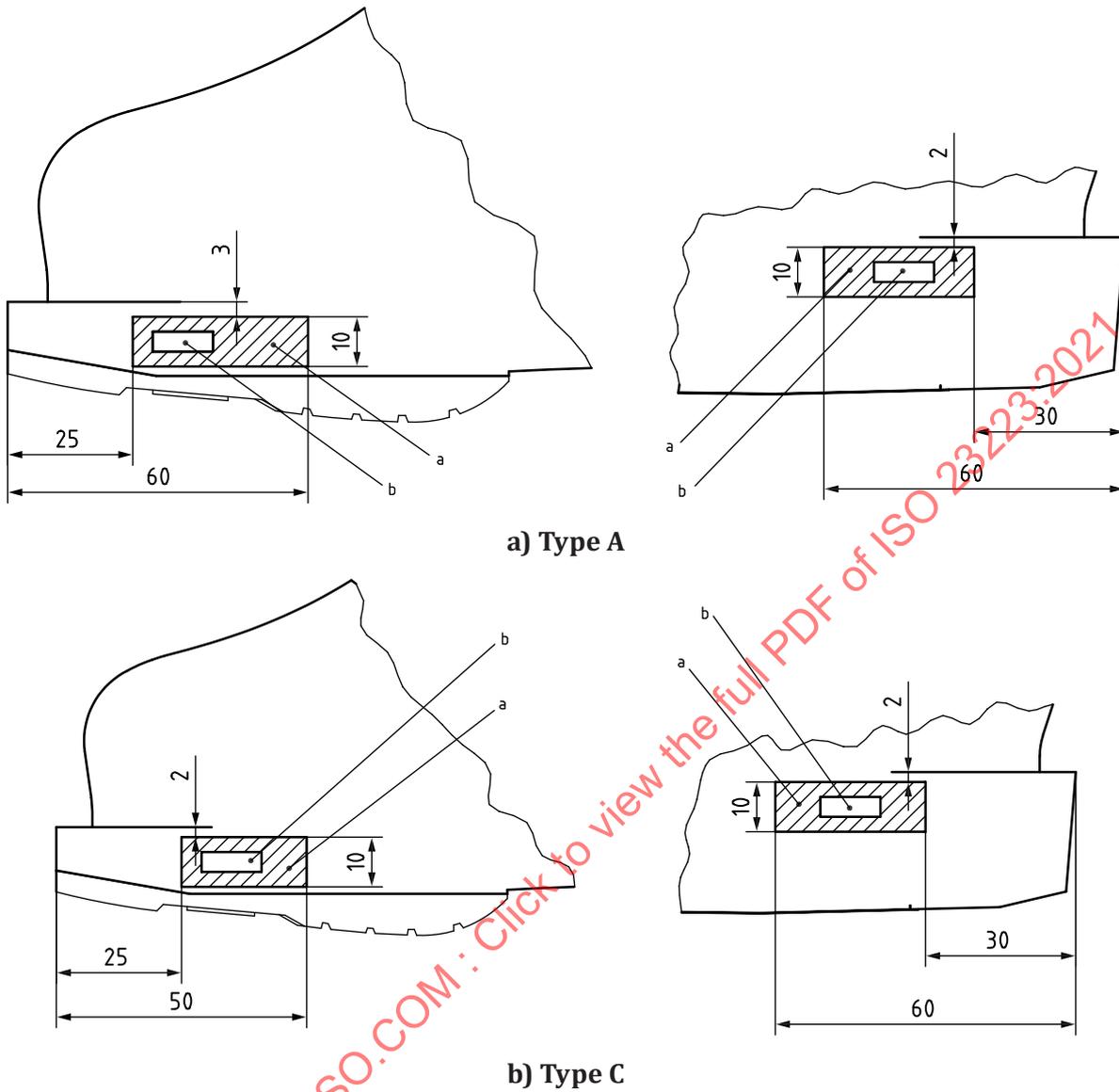
##### 4.3.6.5.1 Toe

On both sides of the boot soles, a contact area of 12 mm x 4 mm for the adjustment device pushing rod shall be available inside the boundaries defined in [Figure 26](#). The contact area shall be parallel to the median plane and shall lie at the same height on both sides of the front part of the sole.

##### 4.3.6.5.2 Heel

On both sides of the boot soles, a contact area of 12 mm x 4 mm for the adjustment device pushing rod shall be available inside the boundaries defined in [Figure 26](#). The contact area shall be parallel to the median plane and shall lie at the same height on both sides of the rear part of the sole.

The shaded areas in [Figure 25](#) shall correspond with the outer shell of the ski boot but shall not contain any edges nor contain any protruding areas.



**Key**

- a Contact zone.
- b Pushing rod.

**Figure 26 — Contact zone for the adjustment device of Type A sole and Type C sole**

**4.3.7 Style of boot shell**

In [Figure 1](#) and [Figure 3](#), sections A-A and B-B, any style of boot shell (exterior surface) is admissible, provided the following:

- it is symmetrical to the median plane;
- in section A-A, the curvature on the front at any point up to a distance of min. 25 mm stays within the limits of
  - Type A:  $41,5 \text{ mm} \pm 3,5 \text{ mm}$ , or
  - Type C:  $35 \text{ mm} \pm 3 \text{ mm}$ .

- in section A-A, the curvature at the back at any point up to a distance of
  - Type A: minimum 26 mm, or
  - Type C: minimum 25 mm.
- stays within the limits of
  - Type A:  $35^{+6}_{-2}$  mm, or
  - Type C: 27 mm  $\pm$  3 mm.

#### 4.3.8 Mounting point

The mounting point for positioning the binding on the ski shall be indicated by a line on each side of the lower surface of the boot as close as possible to the ski. This line shall be clearly visible and permanent. It shall not be less than 10 mm in length and shall not be more than

- Type A: 5 mm, or
- Type C: 4 mm

from the middle of the boot sole length.

The deviation between left and right boot shall not be more than 1 mm.

#### 4.3.9 Sole length

If the sole length that is defined in [Figure 1](#) (Type A) and [Figure 3](#) (Type C) is marked on the boot, such marking shall be within a tolerance of  $\pm 2,5$  mm.

## 5 Marking

Ski-boots shall be marked at least as follows:

- a) Replaceable soles shall be marked with reference to this document (i.e. ISO 23223:2021), at least  $\geq 3$  mm high. Markings shall be placed on each replaceable sole component. A specific technology logo or pictogram or colour code can be added.
- b) Letter symbol A or C for Type of boot on the shell beside the mounting point, at least 5 mm high. The letter shall be permanent and easily recognizable.
- c) Name or trade-mark of the manufacturer or importer.
- d) The boot shall be marked with reference to this document on a clearly visible area from the top on the boot shell, between tip and midsole mark. A specific technology logo or pictogram or colour code can be added. The total marking size should be at least 8 mm.

NOTE For marking the binding see ISO 9462 and ISO 13992 and for boot-binding compatibility see ISO 11088 and ISO 13993.

## 6 Information supplied by the manufacturer

### 6.1 General

An easily comprehensive information supplied by the manufacturer shall be enclosed to each pair of ski boots.

It shall help a non-qualified user to operate, handle and maintain the boots.

The information supplied by the manufacturer shall be provided with a recommendation that this information should be kept by the user for future reference.

## 6.2 User manual

The user manual shall contain at least the following items:

- a) A statement that the product should not be modified except by a trained ski shop technician, who shall ensure the modified boot still complies with this document.
- b) A statement that ski boot buckles shall be closed sufficiently before skiing;
- c) A statement that if the ski boot is provided with a ski/walk selection, the ski boot shall be changed from walk mode to ski mode before skiing;
- d) A statement on the ski boot's intended purpose regarding the use with an appropriate ski binding designed for walking soles;
- e) A statement that ski boots shall be checked for impurities or ice build-up and, if necessary, shall be cleaned before stepping into the binding (this applies especially for interface areas to the bindings);
- f) Care instructions;
- g) Recommendations for a correct storage (e.g. protection from chemicals, temperature, UV radiation);
- h) Recommendation to regularly inspect, especially the low-friction zones by a trained ski shop technician;
- i) Compatibility information to enable the user to select the proper binding;
- j) Replacement soles from manufacturer "XY" shall be used on boots from manufacturer "XY" only. Replacements soles shall not be mixed up between manufacturers;
- k) Warning: All replaceable sole pads shall be in accordance with the same International Standard (ISO 5355, ISO 23223 or ISO 9523);
- l) Warning, that after the replacement of the sole pads, a release test of the ski/boot/binding system in accordance with ISO 11088 or ISO 13993 shall be performed;