
**Alpine and touring ski-bindings —
Test soles for ski-binding tests**

*Fixations de skis alpins et de randonnée — Semelles d'essai pour les
essais de fixations de skis*

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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).

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).

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.

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

This fifth edition cancels and replaces the fourth edition (ISO 9838:2019), which has been technically revised.

The main changes are as follows:

- a new [Clause 8](#) defining test bodies to test the free space to bindings designed to fit soles according to ISO 23223 was added;
- test soles form T with cutouts were removed;
- some dimensions of test soles form A were changed;

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.

Alpine and touring ski-bindings — Test soles for ski-binding tests

1 Scope

This document defines test soles representing

- an alpine ski-boot (form A) or at least the bottom part of it used for testing alpine ski-bindings for alpine skiing in accordance with ISO 9462 and ISO 9465, and
- a touring ski-boot (form T) or at least the bottom part of it used for testing touring ski-bindings for touring skiing in accordance with ISO 13992 and ISO 9465.

This document also defines a test body representing alpine ski-boots with improved walking soles in accordance with ISO 23223.

NOTE Ski-boots have their own International Standards (ISO 5355, ISO 9523 and ISO 23223), which allow relatively large tolerances in defining the test sole that are generally believed to be suitable for on-slope use by skiers, but too large for reproducible laboratory measurements.

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

ISO 5355, *Alpine ski-boots — Requirements and test methods*

ISO 23223, *Alpine ski boots with improved walking soles — Interface with alpine ski-bindings – Requirements and test methods*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 5355 and the following 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/>

3.1

test sole form A

test sole for testing alpine ski-bindings

3.1.1

test sole form A type A

test sole to test ski-bindings suitable for ski-boots for adults

Note 1 to entry: Ski-boots for adults are defined in ISO 5355.

3.1.2

test sole form A type C

test sole to test ski-bindings suitable for ski-boots for children

Note 1 to entry: Ski-boots for children are defined in ISO 5355.

3.2

test sole form T

test sole for testing touring ski-bindings

3.3

basic test sole

one-piece sole of length 305 mm for type A and 255 mm for type C

3.4

variable test sole

sole that is either adjustable in its length or a set of soles differing in their lengths

Note 1 to entry: For type A between 270 mm and 360 mm and for type C between 200 mm and 280 mm.

3.5

test body type A

test body for the dimensional test of freespace to binding for bindings designed to fit with soles in accordance with specific requirements

Note 1 to entry: The requirements shall be in accordance with ISO 23223, Type A.

3.6

test body type C

test body for the dimensional test of freespace to binding for bindings designed to fit with soles in accordance with specific requirements

Note 1 to entry: The requirements shall be in accordance with ISO 23223, Type C.

4 Material and manufacture

The sole shall be moulded in polyurethane (TPU) reinforced by a metal insert in order to achieve the mechanical requirements given in [Clause 6](#). It is moulded in a homogeneous material and in a mould with the same roughness on the sole/binding interface to ensure that the friction coefficient is the same all over this interface.

In the shell areas, reinforcement is allowed to support the walls. It should remain outside the flat area.

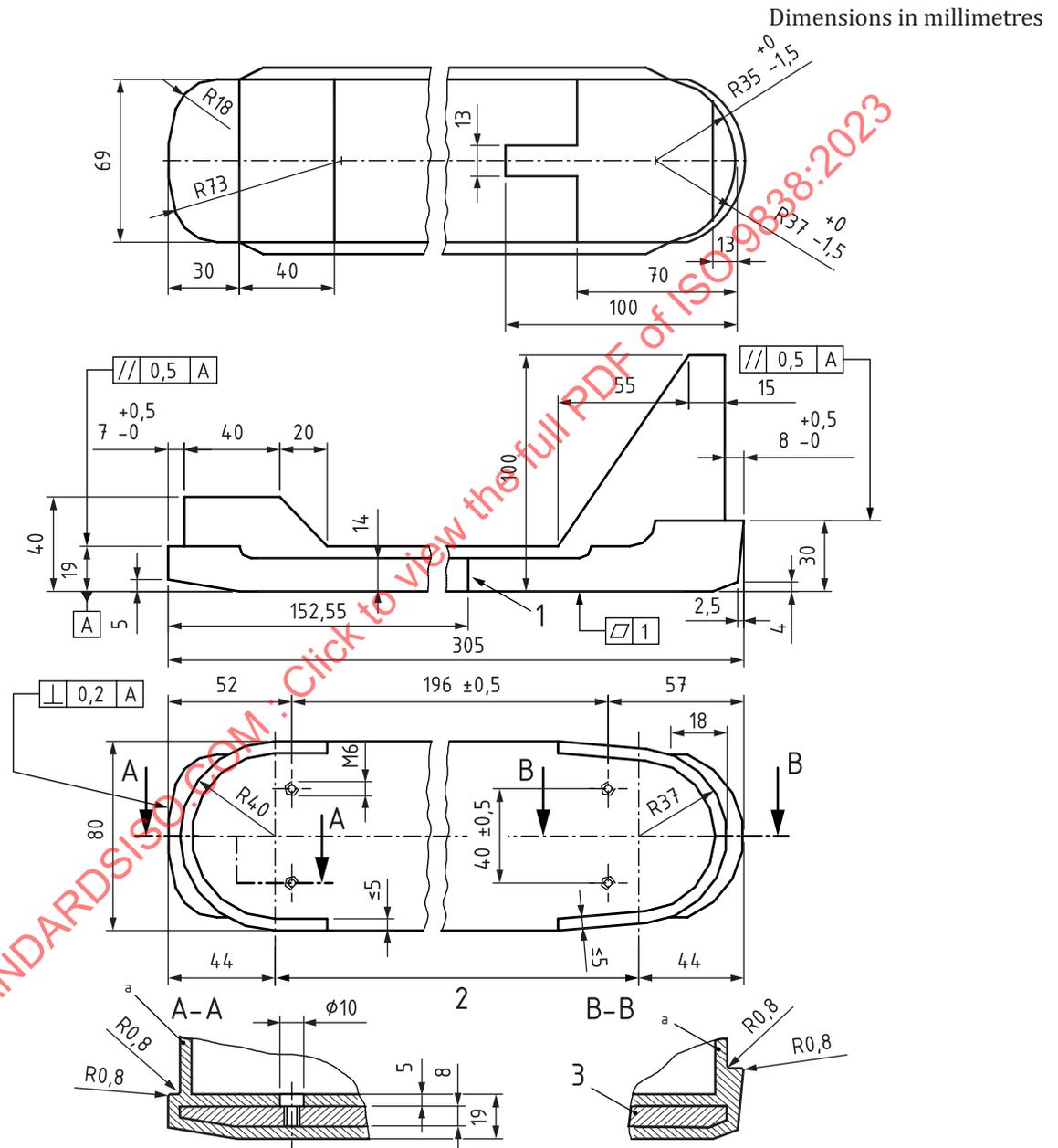
Form T can be based, for example, on the same construction as form A type A with the addition of a TPU part to allow tooling of the defined profile in [Figure 3](#) and glueing of a thick rubber sole of hardness 68 ± 5 Shore A. The dimensions of test sole form T that are not given in [Figure 3](#) shall be taken from test sole form A type A shown in [Figure 1](#).

5 Dimensions

The dimensions of the basic sole shall be as shown in [Figures 1 to 3](#), [Figure 6](#) and [Figure 7](#). All dimensions except for the overall length shall also apply to the variable test sole. All these dimensions shall be within the tolerances given in [Table 1](#). The tolerance for angles is $\pm 0,5^\circ$.

Table 1 — Tolerance

| Dimension | Tolerance for nominal dimension of | | | | |
|--------------------|------------------------------------|---------|----------|------------|-------------|
| | mm | | | | |
| | 0,5 to 3 | >3 to 6 | >6 to 30 | >30 to 120 | >120 to 315 |
| Length dimensions | ±0,15 | ±0,2 | ±0,5 | ±0,8 | ±1,2 |
| Radius and chamfer | ±0,2 | ±0,5 | ±1 | ±2 | — |

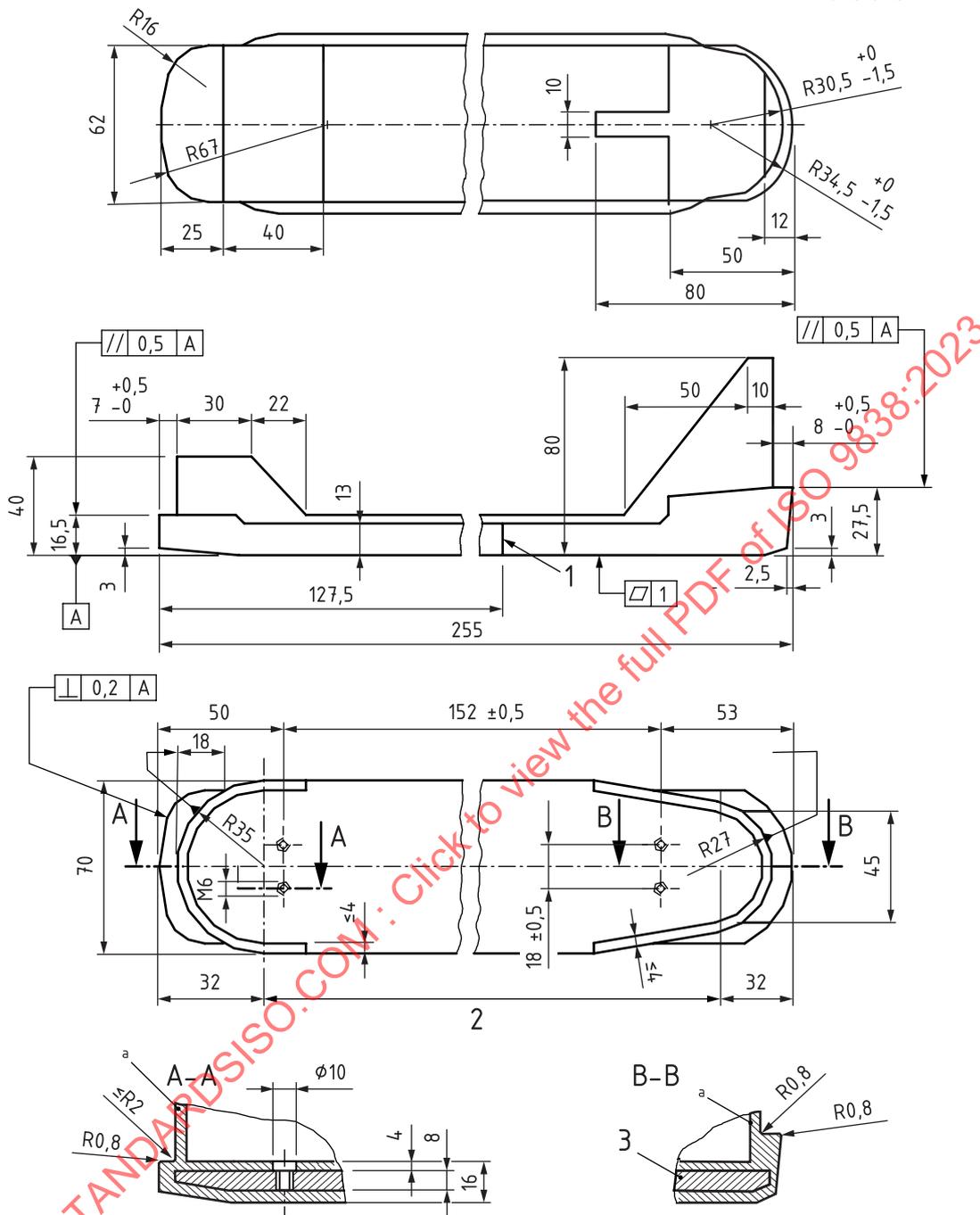


Key

- 1 central mark
- 2 flat area
- 3 reinforcement plate
- a See [Clause 4](#).

Figure 1 — Test sole form A type A

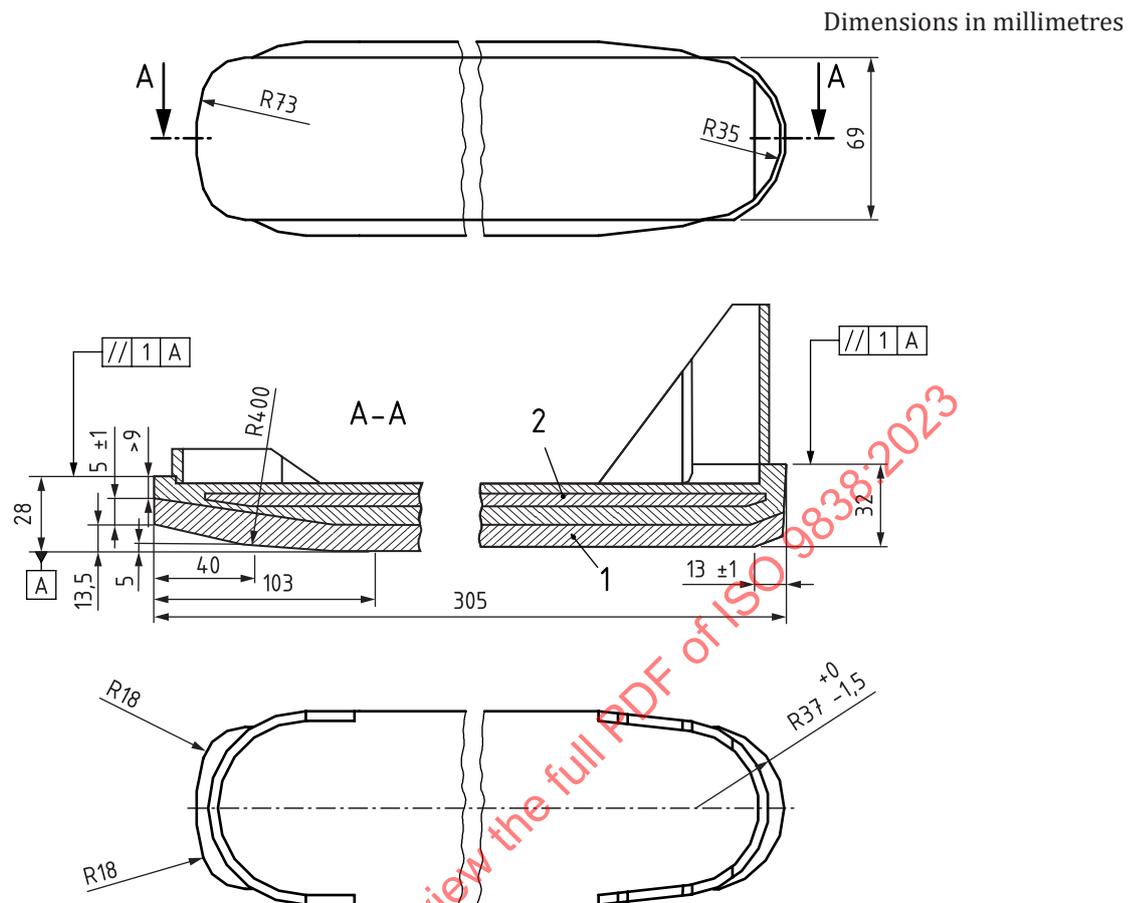
Dimensions in millimetres



Key

- 1 central mark
- 2 flat area
- 3 reinforcement plate
- a See [Clause 4](#).

Figure 2 — Test sole form A type C

**Key**

- 1 68 ± 5 Shore A rubber
- 2 reinforcement plate

Figure 3 — Test sole form T**6 Mechanical properties****6.1 Flexional stiffness**

Place the basic test sole or the variable test sole on two supports as shown in [Figure 4](#). The radius of the supports shall be 10 mm ± 1 mm and the test sole shall be supported over its whole width. Load the test sole vertically for 10 s at its middle by means of a contact ram with a radius of 10 mm and record the deflection under load, eliminating the effect of compressing the rubber sole. Record the residual deflection 20 s after releasing. Test at 23 °C ± 5 °C. The load, F_1 , shall be the following:

- type A: $F_1 = 400$ N;
- type C: $F_1 = 200$ N.

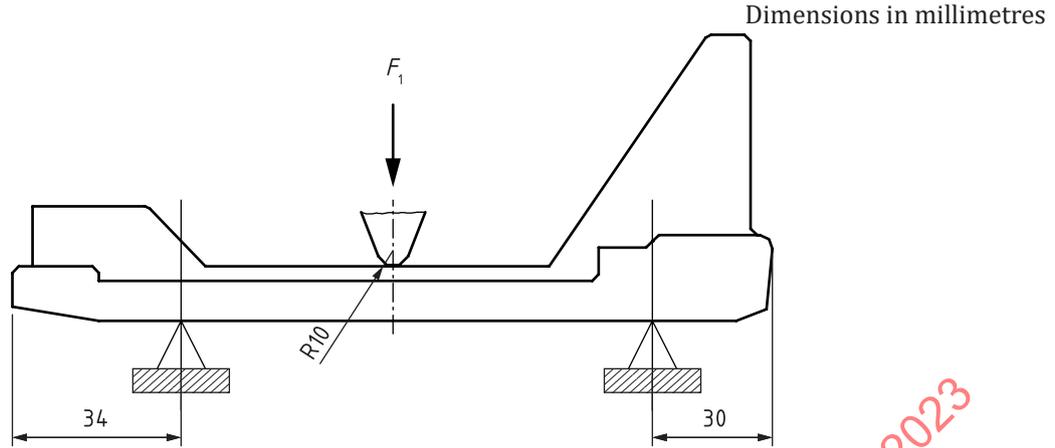
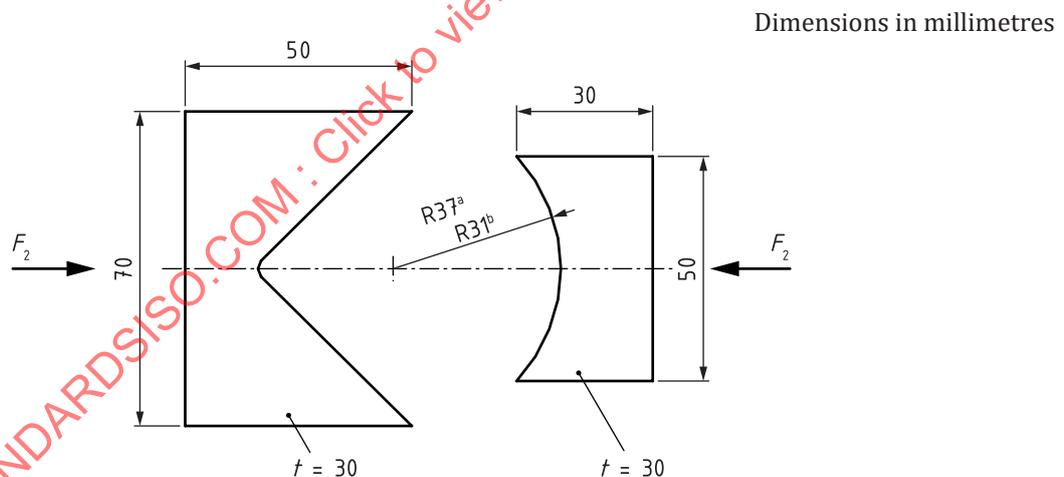


Figure 4 — Test of flexional stiffness

6.2 Compressional stiffness

Place the test sole in a device of aluminium or steel as shown in Figure 5. Compress the test sole for 10 s along its length axis and record the deformation under load. Record the residual deformation 20 s after releasing. Test at $23\text{ °C} \pm 5\text{ °C}$. The load, F_2 , shall be the following:

- type A: $F_2 = 500\text{ N}$;
- type C: $F_2 = 250\text{ N}$.



Key

- t thickness
- a Type A.
- b Type C.

Figure 5 — Device for testing compressional stiffness

6.3 Hardness

6.3.1 Form A types A and C

A measurement of the Shore D hardness shall be carried out on the sole/binding interface in accordance with ISO 868. Test at $23\text{ °C} \pm 5\text{ °C}$.

6.3.2 Form T

A measurement of the Shore A hardness shall be carried out on the rubber sole in accordance with ISO 868. Test at $23\text{ °C} \pm 5\text{ °C}$.

6.4 Coefficient of friction

6.4.1 Form A types A and C

A measurement of the coefficient of friction shall be carried out in accordance with ISO 5355.

6.4.2 Form T

A measurement of the coefficient of friction shall be carried out in accordance with ISO 5355.

6.5 Coefficient of thermal expansion

The difference in length of the test sole at temperatures of 23 °C and -20 °C shall be measured.

6.6 Requirements

The requirements for the properties given in [6.1](#) to [6.5](#) shall be as indicated in [Table 2](#).

Table 2 — Requirements

| Deflection (see 6.1) | | Deformation under compression (see 6.2) | | Shore D hardness of TPU (see 6.3) | Coefficient of friction (see 6.4) | | Coefficient of dilation (see 6.5) |
|---------------------------------------|----------|--|----------|--|--|-----------------|--|
| mm | | mm | | | mm | K ⁻¹ | |
| loaded | residual | loaded | residual | | form A types A and C | | form T |
| ≤2,5 | ≤0,5 | ≤0,5 | ≤0,2 | 50 + 5/0 | 0,065 ± 0,010 | 0,2 ± 0,03 | ≤10 ⁻⁴ |

7 Long-term use

A test sole can be used for tests in accordance with ISO 9462 as long as it meets the requirements of this document. Conformity shall be rechecked regularly, particularly with respect to

- dimensions (wear of the contact area with bindings), and
- friction (presence of binding lubricants, scratches, etc.).

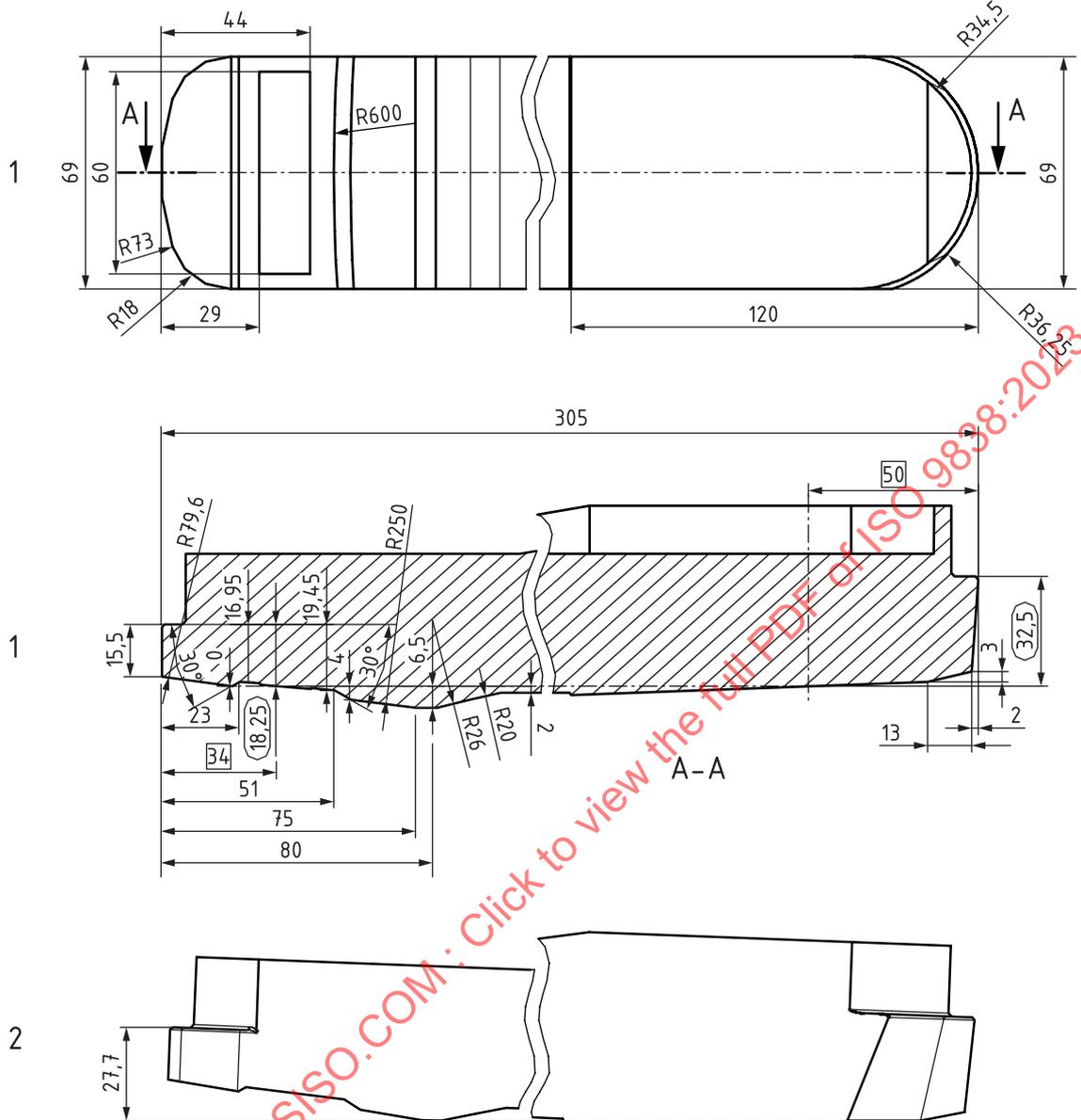
8 Test body for dimensional test of freespace to binding for bindings designed to fit soles according to ISO 23223

To ensure dimensional fit and free space between boot and binding, test body type A and C shall be used.

Dimensions of test body type A are given in [Figure 6](#) and dimensions of test body type C are given in [Figure 7](#). All given dimensions should have a tolerance according to [Table 1](#).

The test bodies shall be made from a rigid material.

Dimensions in millimetres



Key

- 1 position in gauge
- 2 position flat on table

Figure 6 — Test body, Type A according to ISO 23223:2021, Figure C.1