
**Alpine ski-bindings — Requirements
and test methods**

Fixations de skis alpins — Exigences et méthodes d'essai

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ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

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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 9462:2014), which has been technically revised.

The main changes are as follows:

- modification of definitions and addition of notes to entry in [3.1.1](#), [3.1.2](#) and [3.1.3](#);
- addition of [3.1.4](#);
- addition of new [Figure 2](#) “Application of $F_{y,toe}$ and $F_{z,heel}$ ”;
- modification of [4.3](#);
- addition of new [6.8](#) “Compatibility to boot in accordance with ISO 23223”;
- addition of new [Figure 8](#) “Clearance area around the antifriction device (AFD)”;
- addition of new [Table 4](#) “Compatibility marking”;
- correction of scale of [Figure D.2](#) “Tolerances on M_y ”;
- addition of new [Annex E](#) “Test body in accordance with ISO 9838 for compatibility test”.

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 ski-bindings — Requirements and test methods

1 Scope

This document specifies the main characteristics of ski-bindings and describes, as an example, test methods A and B.

This document applies to ski-bindings for alpine skiing for children, juniors and adults.

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

ISO 8061, *Alpine ski-bindings — Selection of release torques values*

ISO 9465, *Alpine ski-bindings — Lateral release under impact loading — Test method*

ISO 9838, *Alpine and touring ski-bindings — Test soles for ski-binding tests*

ISO 11087, *Alpine ski-bindings — Retention devices — Requirements and test methods*

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

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3 Terms and definitions

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

alpine ski-binding

system to ensure firm connection between boot and ski, fixing the heel low for downhill skiing

Note 1 to entry: The system releases the boot from the ski when certain loads reach preset values.

3.1.1

binding of type C

type C binding

binding which can be adjusted to at least the following *release values* (3.3):

- a) $M_z = 10 \text{ Nm}$;
- b) $M_y = 37 \text{ Nm}$

Note 1 to entry: Bindings of type C are suitable for boot soles conforming to type C of ISO 5355.

Note 2 to entry: Bindings of type C for boots with improved walking soles are suitable either for boot soles conforming to type C of ISO 5355 or for boot soles conforming to type C of ISO 23223.

Note 3 to entry: "C" stands for "children".

3.1.2

binding of type CA

type CA binding

binding which can be adjusted to at least the following *release values* (3.3):

a) $M_z = 20 \text{ Nm}$;

b) $M_y = 75 \text{ Nm}$

Note 1 to entry: Bindings of type CA are suitable for boot soles conforming to types C and A of ISO 5355.

Note 2 to entry: Bindings of type CA for boots with improved walking soles are suitable either for boot soles conforming to types A and C of ISO 5355 or for boot soles conforming to types A and C of ISO 23223.

Note 3 to entry: "CA" stands for junior-type bindings.

3.1.3

binding of type A

type A binding

binding suitable for boot soles of type A

Note 1 to entry: Boot soles of type A are defined in ISO 5355.

Note 2 to entry: Bindings of type A for boots with improved walking soles are suitable either for boot soles conforming to type A of ISO 5355 or for boot soles conforming to type A of ISO 23223.

Note 3 to entry: "A" stands for "adult".

3.1.4

binding of type MN

binding suitable for boot soles complying with different standards

Note 1 to entry: The boot soles complying with bindings of type MN are type A soles according to ISO 5355, boot soles of type A of ISO 23223 and boot soles according to ISO 9523.

Note 2 to entry: "MN" stands for "multi-norm".

3.2

release

detachment of the boot from the ski by freeing of the mechanism that ensures the connection between the boot and the ski

Note 1 to entry: This release is only considered effective when all the loads due to the boot-ski connection have dropped to values which present no danger to the skier.

3.3

release value

maximum value of the torque M_z or M_y caused at the boot-ski connection by the movement of rotation or forward bending

Note 1 to entry: For the torques M_z and M_y , see [Figure 1](#).

Note 2 to entry: The release values are generally adjustable on current bindings which have a scale and an indicator displaying the setting level.

Note 3 to entry: In the present state of the art, bindings are designed at least to release in torsion ($\pm M_z$) and in forward bending ($\pm M_y$).

3.4 reference value

value, adjusted after a series of tests, used as a basis of comparison to evaluate the behaviour of the binding during the tests

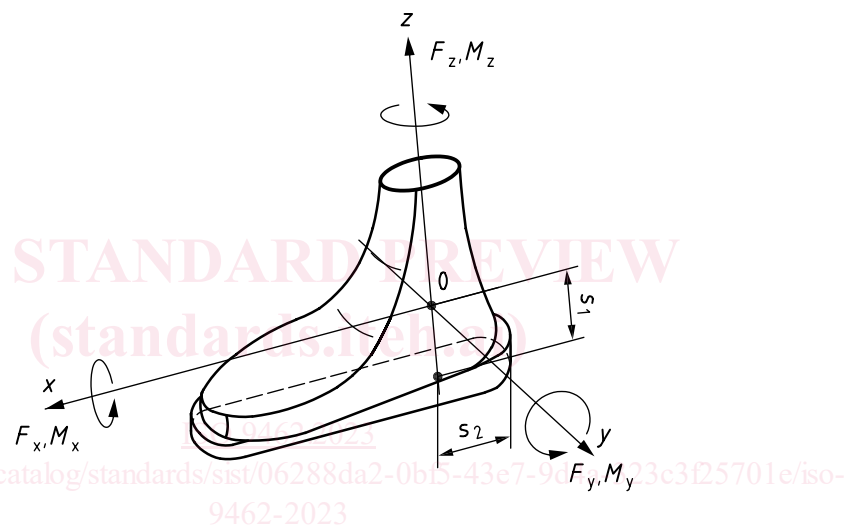
Note 1 to entry: See [6.3.1](#).

3.5 combined loading

loading of the sole or ski in several directions at the same time, where one of the loads is the torque M_z progressively applied to the sole until the binding releases

Note 1 to entry: Each of the load combinations simulates a given situation, chosen within an infinite field of possibilities and simplified for the purpose of the tests. The main simplification being that the loads applied additionally to the release torque M_z are held constant in value and direction during all the release process.

Note 2 to entry: For the loading, see [Figure 1](#) and [Table 1](#).



Key

- F_x anterior/posterior force
- F_y medial/lateral force
- F_z vertical force
- M_x edging/roll moment/torque
- M_y forward/backward lean moment/torque
- M_z twisting moment/torque
- 0 origin of the coordinate system
- S_1 vertical distance from boot sole
- S_2 horizontal distance from end of the heel projection of the boot

Figure 1 — Combined loadings

Table 1 — Coordinates of reference point 0

	Type of binding		
	C (see 3.1.1)	CA (see 3.1.2)	A (see 3.1.3)
S_1	85	100	100
S_2	70	80	80

**3.6
additional load**

load applied additionally to the release torque M_z

Note 1 to entry: For the torque M_z , see [Figure 1](#).

**3.7
deflection of the ski**

bending of the ski perpendicular to its gliding surface

Note 1 to entry: In practice, the deflection of the ski depends at the same time on the loading situation and the profile of the snow-surface ("geometrical" situation). In test simplification, only the "geometrical" situation is simulated.

**3.8
limit L_1**

lowest possible position of the setting indicator

**3.9
limit L_2**

position of the indicator at the lowest mark on the setting scale

**3.10
limit L_3**

position of the indicator at the highest mark on the setting scale

**3.11
limit L_4**

highest possible position of the setting indicator

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4 Test conditions

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4.1 Loading rate

The tests shall be performed quasi-statically, ensuring that the following indicative values of the torque gradient conform to:

a) torsion release:

The angular velocity of the test shall be for:

M_z (moment in z-axis)

$3,8^\circ/s \pm 0,1^\circ/s$

$F_{y,toe}$ (horizontal force applied at the toe, see [Figure 2](#))

$5 \text{ mm/s} \pm 2 \text{ mm/s}$

b) forward bending release:

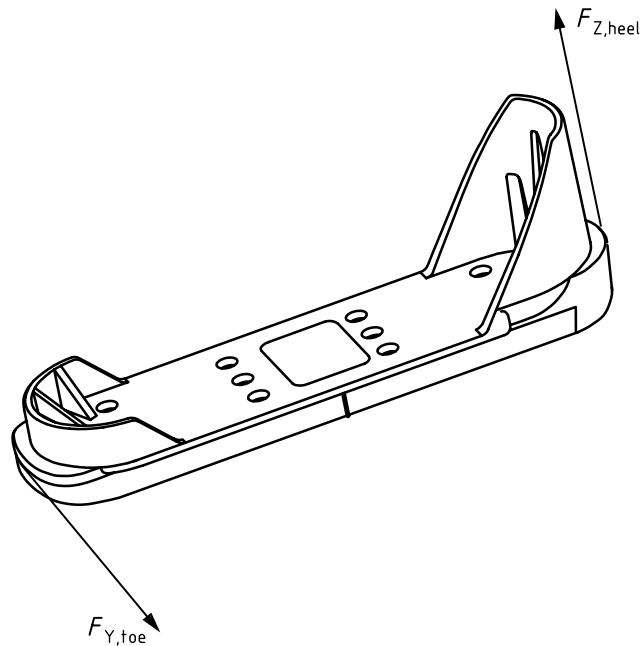
The angular velocity of the test shall be for:

M_y (moment in y-axis)

$3,8^\circ/s \pm 0,1^\circ/s$

$F_{z,heel}$ (vertical force applied at the heel, see [Figure 2](#))

$5 \text{ mm/s} \pm 2 \text{ mm/s}$

**Key**

$F_{y,toe}$ medial/lateral force at the toe

$F_{z,heel}$ vertical force at the heel

Figure 2 — Application of $F_{Y,toe}$ and $F_{Z,heel}$

4.2 Accuracy of measurement

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The measurement error of the release value in torsion shall be smaller than $\pm 2\%$ for values above 50 Nm inclusive and ± 1 Nm for values below 50 Nm.

The measurement error of the release value in forward bending shall be smaller than $\pm 2\%$ for values above 200 Nm inclusive and ± 4 Nm for values below 200 Nm.

The test equipment shall be designed to allow the application of pure moments without any extraneous forces during the entire release process.

4.3 Test sole

The test sole shall be in accordance with ISO 9838.

If a boot-binding system requires a specific boot-sole design, a test sole should be cut from a boot provided by the manufacturer and adapted for test needs.

If the binding is a multi-norm binding, all tests shall be carried out with test sole form A type A. In addition, with one binding and test sole form T the following tests shall be carried out:

- a) accuracy of the setting scale (6.2.1.3);
- b) release with ski deflection (6.3.3);
- c) general requirement about scattering (6.3.4.1);
- d) influence of forward lean of the body (6.3.4.3);
- e) influence of roll loading (6.3.4.4);
- f) influence of backward lean of body (6.3.4.5);

- g) influence of the axial force ([6.3.4.6](#));
- h) snow pack ([6.3.7](#));
- i) energy absorption (resetting) ([6.4](#)).

If the binding is for boots with improved walking soles, then it shall be tested with the test sole in accordance with ISO 9838 form A type A or form A type C.

The test sole shall be degreased, washed, and dried before testing.

4.4 Test ski

For the release tests in the laboratory, the bindings shall be mounted either on whole skis or on appropriate sections of skis. If the binding is pre-mounted (already mounted on the ski by the producer), use the ski with which the binding is delivered in its medium size. If not, choose a ski which represents the market.

5 Test methods A and B

5.1 Principle

The binding shall be mounted on a ski in accordance with the manufacturer's instructions. A test sole shall then be inserted in the binding.

In method A, the ski is rigidly connected to the test frame and the torque M_z or M_y is progressively applied to the sole until the binding releases. The peak value of M_z or M_y is recorded.

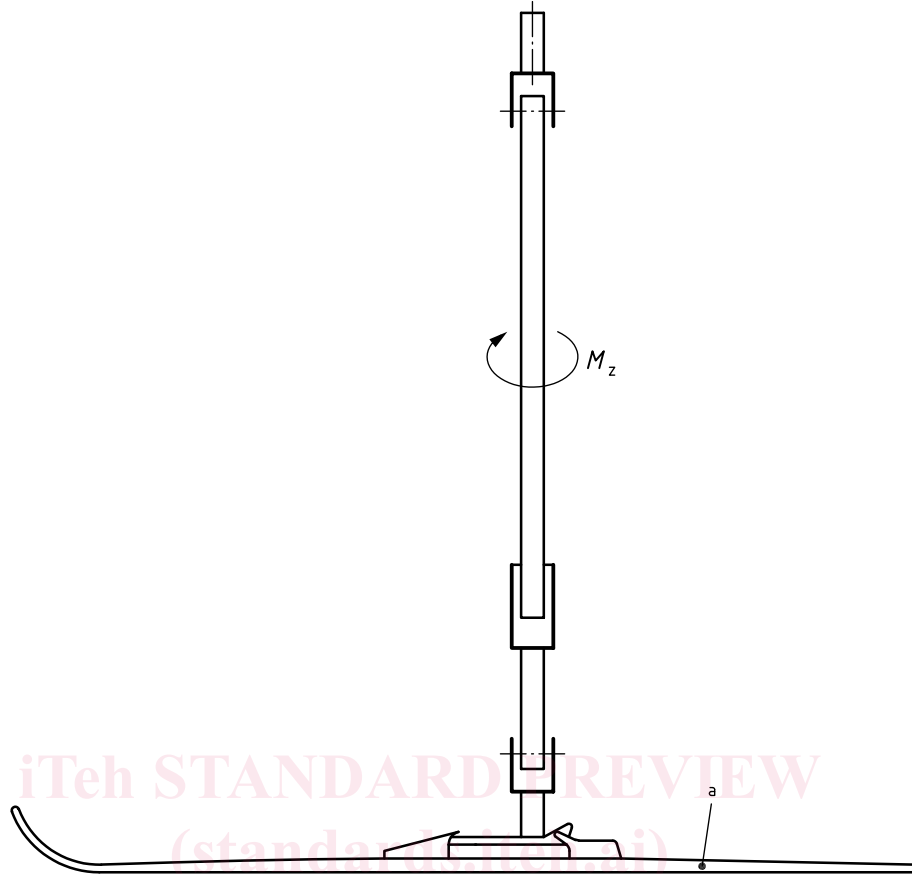
In method B, the sole is rigidly connected to the test frame through a sensor that measures the torques M_z and M_y . Forces are progressively applied to the ski until the binding releases. The peak value of M_z or M_y is recorded.

[Annexes A](#) and [B](#) give examples of how to realize method A or method B.

Passing by either method shall be deemed satisfactory.

5.2 Simple torsion test

For method A, see [Figure 3](#).

**Key**

a Fixed ski.

M_z Twisting moment

Figure 3 — Application of M_z torque and measurement of $M_{z,max}$

For method B, see [Figure 4](#).