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Alpine ski-bindings — Retention devices — Requirements and test methods

Fixations de skis alpins — Dispositifs de retenue — Exigences et méthodes d'essai

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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ISO 11087 was prepared by Technical Committee ISO/TC 83, *Sports and recreational equipment*, Subcommittee SC 3, *Ski bindings*.

This second edition cancels and replaces the first edition (ISO 11087:1997), which has been technically revised.

Alpine ski-bindings — Retention devices — Requirements and test methods

1 Scope

This International Standard specifies the requirements for ski brakes and binding straps.

It applies to alpine retention devices which are used to reduce the risk of injury, caused by the ski after the ski's release.

2 Normative references

The following referenced documents are indispensable for the application 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 554:1976, *Standard atmospheres for conditioning and/or testing — Specifications*

ISO 5355:1997, *Alpine ski-boots — Safety requirements and test methods*

ISO 6289:2003, *Skis — Vocabulary*

ISO 8364:1999, *Alpine skis and bindings — Binding mounting area — Requirements and test methods*

ISO 9462:1993, *Alpine ski-bindings — Safety requirements and test methods*

ISO 9838:1991, *Alpine ski-bindings — Test soles for ski-binding tests*

3 Terms and definitions

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

3.1
ski brake
retention device for alpine skiing which is integrated into the ski binding and which is designed to slow down a ski which has come off after the release of a ski binding

NOTE Integrated ski brakes represent the state of the art.

3.2
course of fall
area that can be passed over by a skier after a fall, the length of which corresponds to the braking distance of the skier measured between the point of fall and the stoppage, the width of the area being assumed to be approximately 5 m

4 Requirements

4.1 Compatibility with binding function

The ski brakes shall comply with the requirements in ISO 9462 and ISO 5355 which are relevant for ski brakes.

4.2 Interference with skiing

The ski brake shall not interfere with skiing. It shall be designed to prevent a catching of the ski or a skidding due to premature contact of the ski brake with the slope during skiing, even in steep terrain. During skiing, the ski brake shall not switch into the braking position without the need to do so.

4.3 Mechanical stability

The design of the ski brake shall be able to withstand, without damage, the loads occurring in practice.

4.4 Functional reliability

Cold, snow and icing shall not interfere with the proper release of the ski brake.

4.5 Automatic function

The ski brake shall release independently, without handling by the skier. If the ski brake is provided with a locking mechanism, this locking mechanism shall be automatically released after having stepped into the binding. The operation of the ski brake may be set out of function by means of tools of inserts, if necessary, to facilitate the maintenance or care of the ski equipment. In this case, the device shall be designed in such a way as to prevent stepping into the binding without removing the inserts or tools. If this is not possible, a clear statement shall be provided with the insert or with the ski brake's information material.

4.6 External design

The external design of the ski brake shall be such that, during correct use, there is no greater risk for the skier to get injured by the ski brake than, for example, by the ski binding itself.

4.7 Braking effect

The ski brake shall slow down the ski from every possible position on the slope, independent of snow conditions and the nature of ground that may be found during skiing. It is desired that the ski stops within the course of fall of the skier.

5 Test methods

5.1 Sampling

Two complete binding/brake systems (including plates, if any) are required for the test.

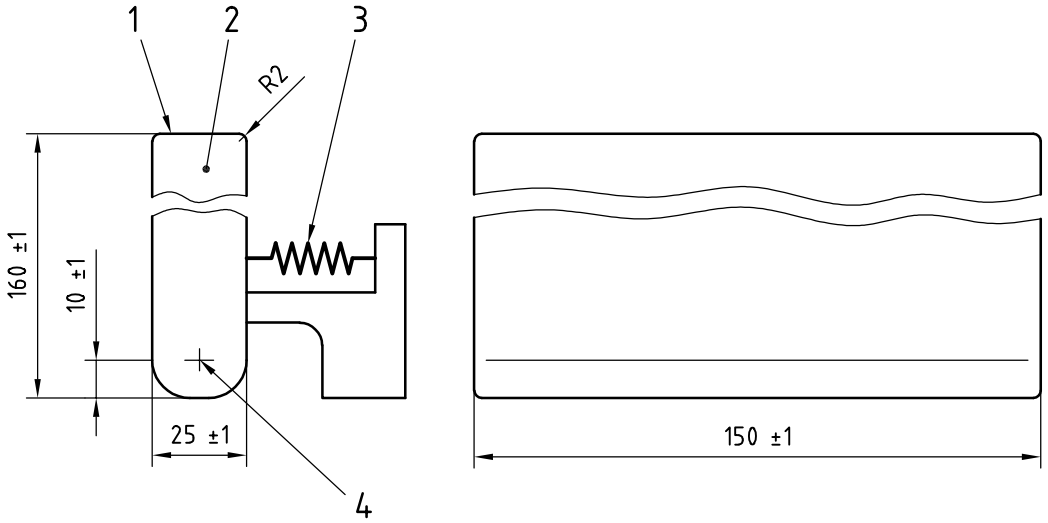
One test sample shall be selected for each laboratory test (one sample for the tests according to 5.4.6)

If one of the selected test samples does not meet the requirements, two substitute test samples shall be selected, which have to meet the requirements in order to pass the tests.

5.2 Apparatus

5.2.1 Impact block

Dimensions in millimetres



Key

1 top edge
2 impact block
3 spring
4 centre of rotation

Figure 1 — Impact block

The impact block is made of aluminium.

An initial tension of 60 N is produced by means of a tension spring, the top edge of the impact block being the reference surface. The spring constant is 4 N/mm.

5.2.2 Test ski

The test ski, on which the ski brake to be tested is mounted, shall have the characteristics shown in Table 1.

Table 1 — Test ski

	Adults' ski	Children's ski
Length	(2 000 ± 50) mm	(1 500 ± 50) mm
Mass without binding and brake	(2,0 ± 0,1) kg	(1,3 ± 0,1) kg
Mass of the ski-binding + reference brake	(1,3 ± 0,1) kg	(1,3 ± 0,1) kg
Bottom camber [a]	(12 ± 2) mm	(10 ± 2) mm
Thickness at binding mounting	(20 ± 2) mm	(18 ± 2) mm
[a] Maximum camber height measured at the highest point of the running surface, see ISO 6289.		

The mass of the ski shall be compensated, without the binding mounted, so that the difference is not greater than 0,1 kg with regard to the reference ski.

5.2.3 Test sole

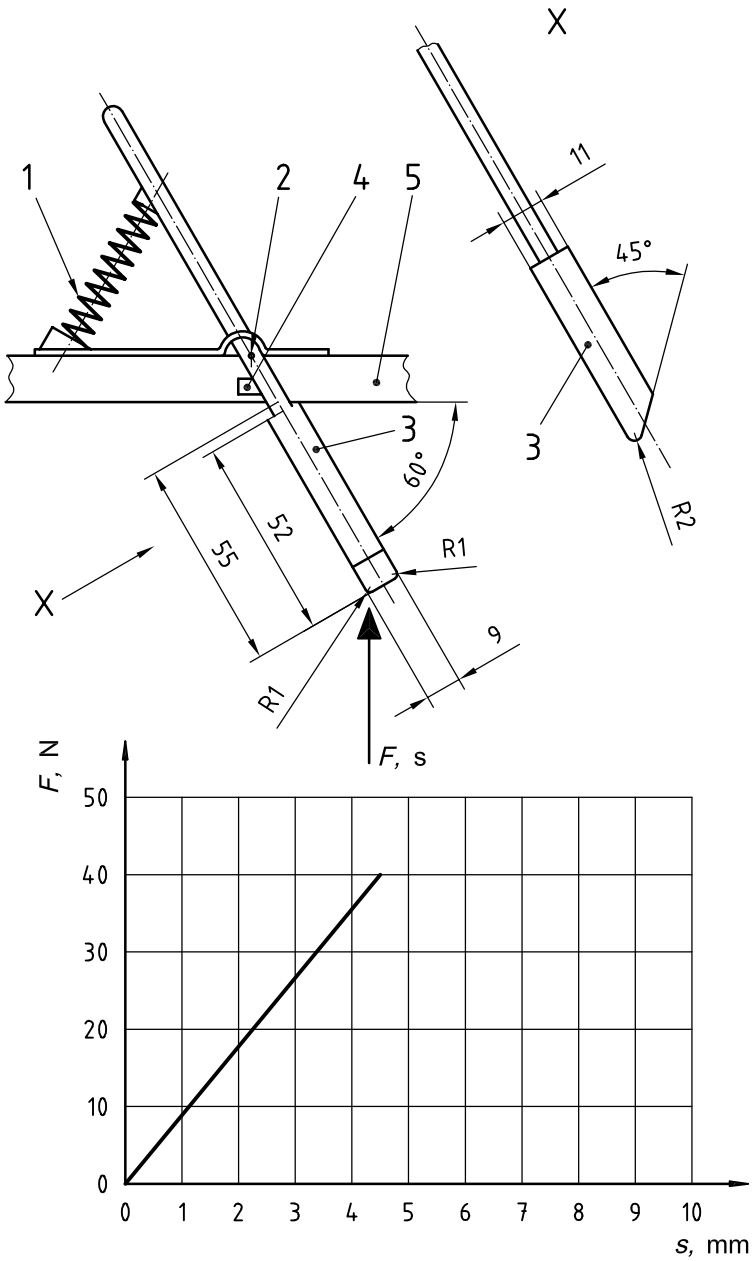
A sole as described in ISO 9838 shall be used as the test sole.

5.2.4 Reference brake

The reference brake is the comparative basis for testing the braking effect of ski brakes.

The design of the reference brake is specified in Figure 2.

Dimensions in millimetres



Key

1	compression spring	5	ski
2	mounting point in accordance with ISO 8364		
3	two spades arranged symmetrically to the longitudinal axis of the ski	F	Force
4	stop	s	Thickness of ski

Figure 2 — Reference brake

5.2.5 Reference ski

The reference ski shall comply with the requirements for the test ski. The braking system shall be mounted within the requirements given by the brake manufacturer.

5.2.6 Remote control device

A suitable device shall be used to initiate the braking action of the ski brake to be tested as well as the reference brake when the ski has attained a speed of 8 ± 1 (m/s).

5.2.7 Course

Carry out the dynamic tests of the braking efficiency by using the test ski specified in 5.2.2 and the reference ski specified in 5.2.5 on a course having a slope of $28° \pm 3°$.

Roll and tread down loose snow by means of side-steps.

5.3 Conditions

Unless otherwise specified, carry out the laboratory tests at standard atmosphere 23/50 in accordance with ISO 554.

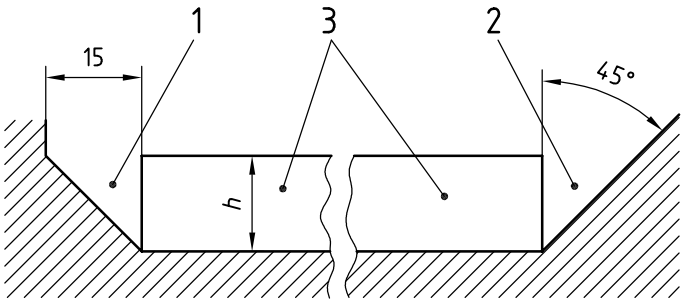
Wax the test ski and the reference ski in such a manner as to ensure minimum sliding friction between the running surface and the course.

5.4 Procedure

5.4.1 Test for interference with skiing

Examine potential interference with skiing caused by the ski brake by a laboratory test. Verify, with the smallest ski (or ski-section) recommended by the retention-device manufacturer, that the “Non interference” areas according to Figure 3 are not exceeded.

Dimensions in millimetres



Key

1 “Non interference” area for ski brakes with brake unit (trail spades) in the direction of the ski tip.

2 “Non interference” area for ski brakes with brake unit (trail spades) in the direction of the ski tail (or in the direction of the ski tip covering or other designs).

3 ski

h = 20 mm for adults' ski

h = 18 mm for children's ski

Figure 3 — “Non interference” areas at the ski for the ski brake

5.4.2 Testing of the mechanical stability

Test the mechanical stability at − 20 °C.

Suspend the ski according to Figures 4 and 5 in such a manner that the top edge of the impact block lies at half the distance between the running surface of the ski and the end of the brake out.

Lift the ski to a height of 850 ± 50 mm and release it against the impact block.

For testing the stability of the brake unit's bearing, release the same ski against the impact block three times in the direction of the ski tip and three times in the direction of the ski tail as indicated in Figure 4.

For testing the stability of the brake unit, release the ski against the impact block three times on the left side and three times on the right side as indicated in Figure 5.

5.4.3 Testing of the functional reliability

Conduct tests with regard to the influence of icing in accordance with ISO 9462.

5.4.4 Testing of the enforced reaction

The function of the ski brake shall be tested by repeatedly stepping in and out with the test sole at room temperature and in accordance with the icing test in ISO 9462.

5.4.5 Testing of the external design

Subject the external design to a visual inspection.

5.4.6 Testing of the breaking effect

Carry out the following ski-brake tests on the course at a speed of (8 ± 1) m/s:

a) five tests with the test ski with its tip running forward;

b) five tests with the test ski with its tip running backwards;

c) five tests with the reference ski with its tip running forward.

The mean value of the stopping distance of a) and b) shall not exceed the mean value of c) by more than 20 %.

5.4.7 Test report

With reference to this International Standard, the test report shall include the following information:

— brand;

— model designation;

— serial number (if given);

— suitability of the ski brake for adults' ski or children's ski;

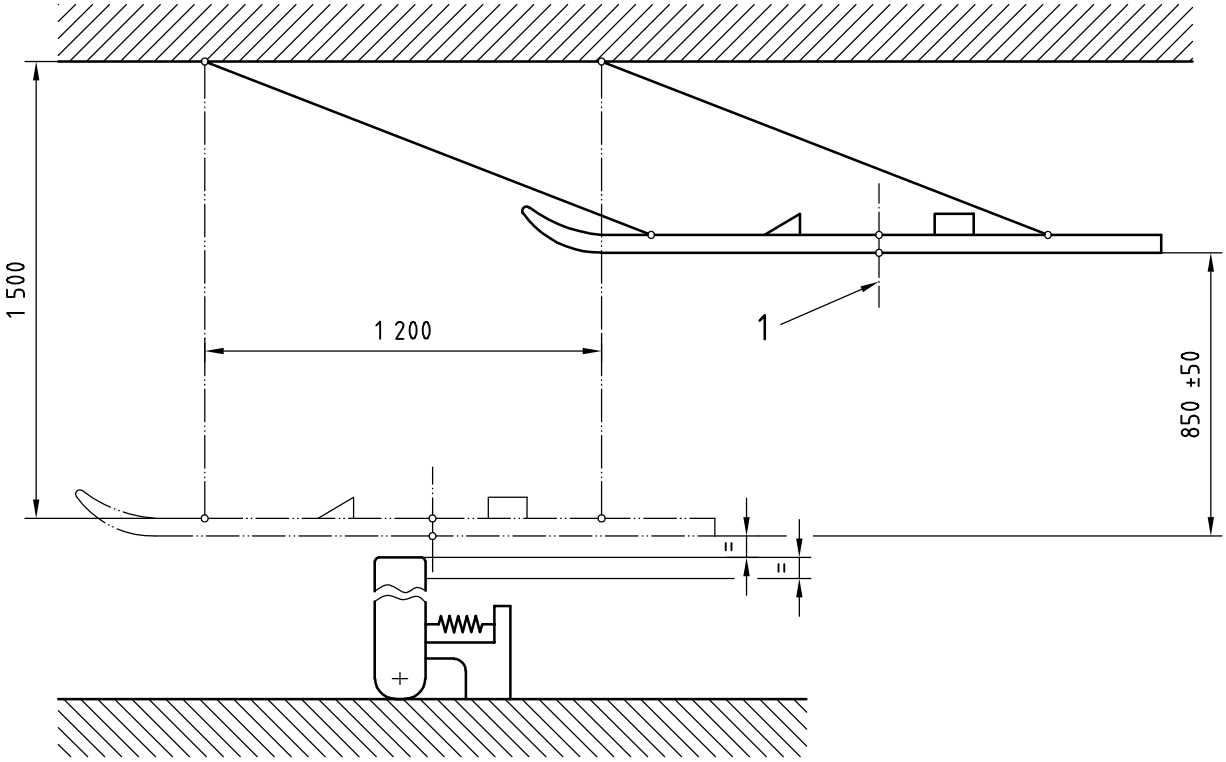
— widths of the ski for which the ski brake is suitable;

— with regard to the test equipment used: type, measuring range, measuring accuracy, speed of loading;

— maximum height from the running surface of the ski;

— maximum weight of the total sliding equipment.

Dimensions in millimetres



Key

1 Ski brake in braking position

Figure 4 — Testing of strength of the brake unit's bearing

Dimensions in millimetres

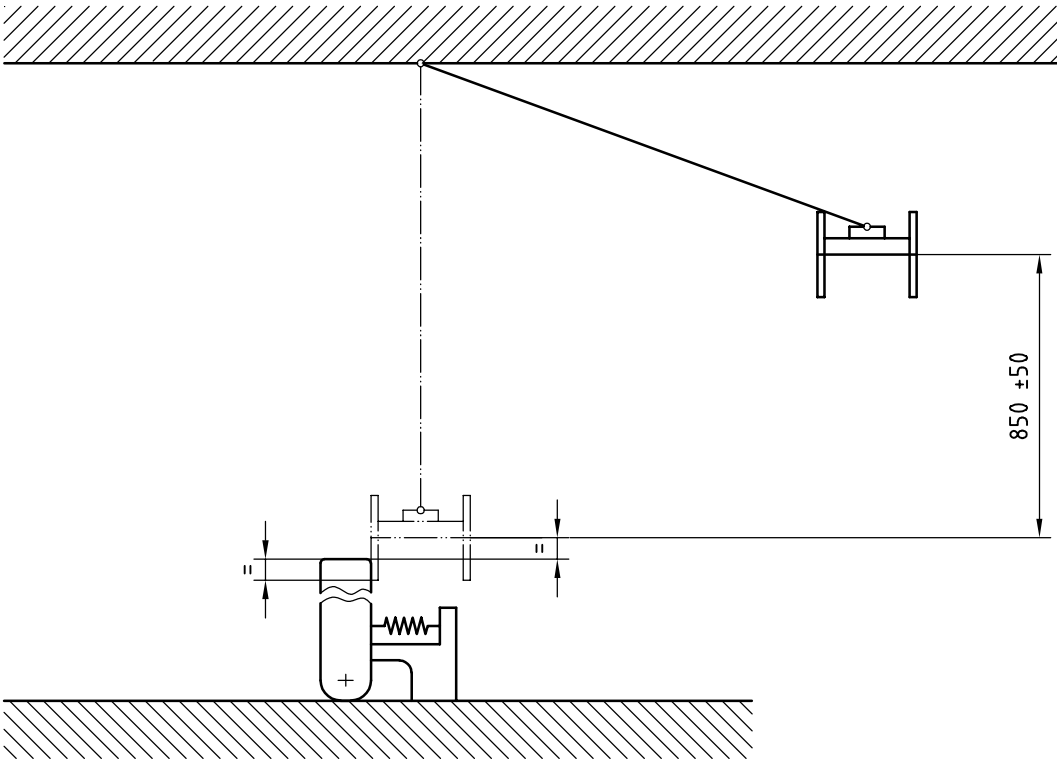


Figure 5 — Testing of the strength of the brake unit

6 Instruction for use

Each ski brake shall be accompanied by instructions for use including the following information:

a) how to use the retention device;

NOTE The mounting procedures, delivered by the ski brake manufacturer, should additionally include the data of the weight, width and height of the reference ski.

b) maintenance and care;

c) a warning that problems may arise when skiing in deep snow.

Annex A
(normative)

Binding straps

Retention devices such as binding straps may nevertheless be desirable for special purposes, such as off-piste-skiing or in deep powder conditions, since they are suitable for holding the ski to the skier after the release of a ski binding.

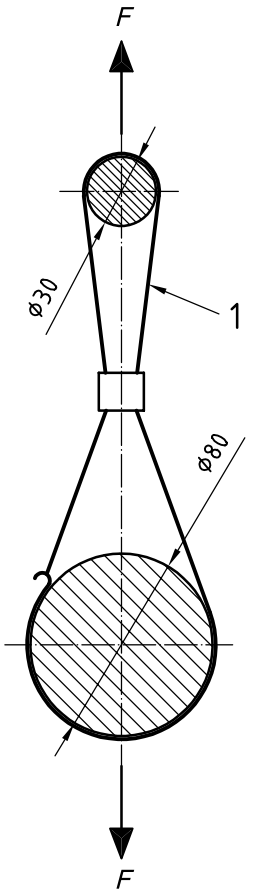
Binding straps shall be designed such that

— closing and opening is possible under all environmental conditions occurring during skiing, even with ski gloves,

— there is no interference with the functioning of the ski-binding nor with skiing, and

— the tensile force (tested according to Figure A.1) and the tensile energy exceed the limits given below.

Dimensions in millimetres



Key

1 binding strap

Figure A.1 — Test arrangement for binding straps

a) Binding straps for adults' bindings

   — minimum tensile strength 1 500 N

   — minimum tensile energy 75 N·m

b) Binding straps for children's bindings

   — minimum tensile strength 1 000 N

   — minimum tensile energy 50 N·m

In order to prevent any catapult effect, the reversable energy shall be less than 50 %.

ICS 97.220.20

Price based on 10 pages