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Snowboard step-in bindings — Requirements and test methods

Fixations de surf des neiges de type «step-in» — Exigences et méthodes d'essai

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ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

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Foreword

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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.

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.

ISO 15344 was prepared by Technical Committee ISO/TC 83, *Sports and recreational equipment*, Subcommittee SC 3, *Ski bindings*.

Snowboard step-in bindings — Requirements and test methods

1 Scope

This International Standard specifies the essential requirements for a snowboard step-in binding – boot system (see 3.1), hereafter referred to as step-in snowboard bindings.

This International Standard is applicable to step-in snowboard bindings for adults and children.

This type of binding system utilizes a mechanical interlocking mechanism, and the interlock mechanism of the system will be specific to the particular manufacturer. Compatibility between different systems is not expected or anticipated thus each potential combination of boot and binding requires testing.

For snowboard plate bindings without a release mechanism, see ISO 14790.

For snowboard strap bindings for soft boots, see ISO 14573.

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 6004:1991, *Alpine skis — Ski binding screws — Requirements*

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

ISO 10958-1, *Snowboards — Binding mounting area — Part 1: Requirements and test methods for snowboards without inserts*

ISO 10958-2, *Snowboards — Binding mounting area — Part 2: Requirements and test methods for snowboards with inserts*

3 Terms and definitions

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

3.1
snowboard step-in binding – boot system
interlocking system that connects a snowboard boot and a snowboard that utilizes a step-in interface

3.2
snowboard step-in binding type A
binding suitable for over 45 kg body mass (adults)

3.3
snowboard step-in binding type C
binding suitable exclusively for a body mass up to 45 kg (children)

4 Parameters

All possible strains on the boot can be attributed to one torque, M, and one force, F, on each x, y, z of a system of coordinates. The point of origin of the coordinates is fixed as in the centre of the ankle joint which is located approximately 100 mm from the plantar surface and 80 mm from the back of the heel.

The torques and forces illustrated in Figure 1 are positive. The corresponding parameters acting in opposite directions are given negative signs. The arrow heads indicate the sense of rotation of the snowboard boot movement.

Dimensions in millimetres

s_1	100
s_2	80

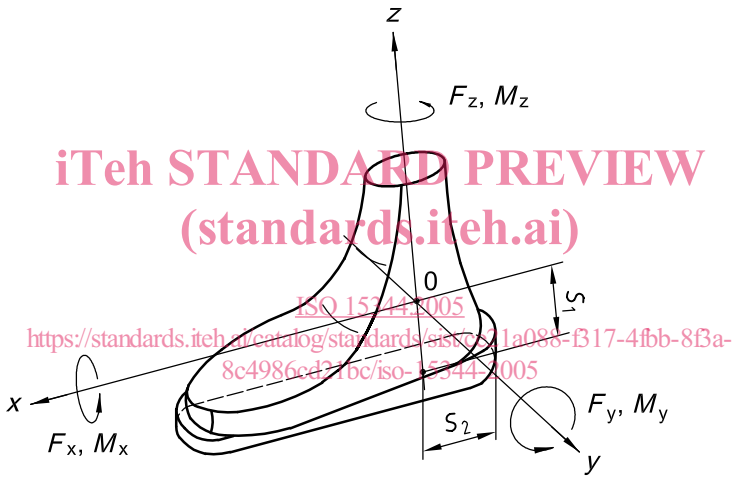


Figure 1 — Torques and forces

5 Requirements

5.1 Function

The snowboard binding shall be such that in practical use the boot remains connected to the snowboard under all loads occurring in winter terrain. This requirement is met if, after testing in accordance with 6.6 and 6.7:

a) there are no fractures, cracks or other indications of permanent deformation in the binding;

b) the binding can attach the boot in the original manner;

c) the attached boot does not slip out of the binding;

d) the boot can be moved from the binding in the original manner.

5.2 Retaining leash and mounting point for retaining leash

The mounting points for the retaining leash shall be indicated by the manufacturer.

The minimum breaking force of the mounting point and of the retaining leash shall be 500 N.

5.3 Snow pack

Each snowboard binding shall latch with a minimum of 2 mm snow pack between the boot sole and the binding.

5.4 Mounting screws

The snowboard binding shall be supplied with all parts necessary for mounting the binding to the board as per the manufacturer's instructions.

Metric screws shall be used, preferably M6 Class G for snowboards with inserts (see ISO 10958-2), or ski-binding screws in accordance with ISO 6004 for snowboards without inserts (see ISO 10958-1).

6 Test methods

6.1 Principle

This test method describes the steps required to evaluate a snowboard binding system function. The method consists of a series of laboratory tests that evaluate resistance to static and dynamic loading, function under cold and icy conditions, fatigue behaviour and assessment of potential false positive latch. All tests shall be passed.

6.2 Apparatus

6.2.1 Artificial leg, with fixed ankle joint of 80° without toe-section (see Figure 2) appropriate to the mid range of the size of the boot shall be used for the binding test.

6.2.2 A rigid plate, e.g. a steel plate of at least 10 mm thickness, with the appropriate mounting hole pattern for mounting the binding, capable of supporting the applied loads and moments.

6.2.3 Test device, capable of applying the described forces and moments.

6.2.4 Fatigue test device, for cyclic loading at the prescribed rates.

6.2.5 Impact test device, capable of delivering 200 J of energy at an impact speed of 6 m/s.

6.3 Sampling and conditioning

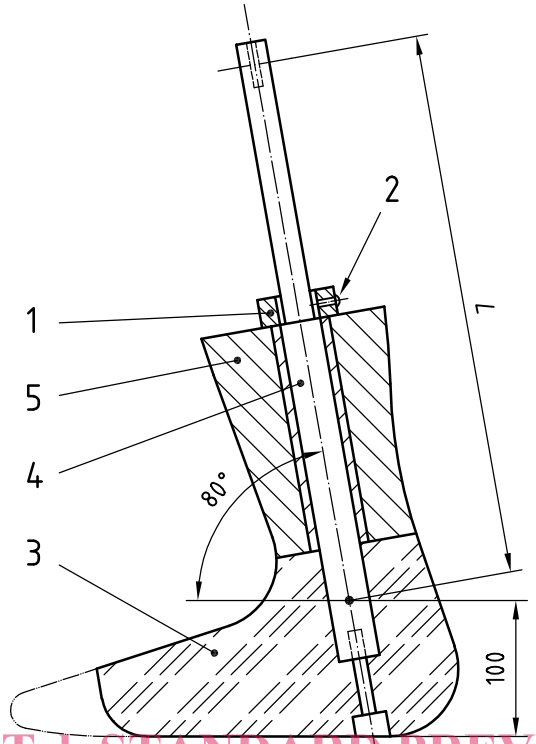
Three samples of snowboard boots and bindings shall be used for lab testing – one new sample for each potentially destructive test method.

Unless otherwise noted, execute the testing under standard atmosphere 23/50, in accordance with ISO 554, with ordinary tolerances.

To accomplish this goal, precondition the samples at − 20 °C for a minimum of 1,5 h just prior to testing.

Unless otherwise noted, start the test within 2 min. Surface temperature measurements should be made to ensure that sufficient conditioning time has been achieved.

Dimensions in millimetres



Key

1	socket	4	steel axis
2	screw	5	resin calf
3	aluminium foot	L	1 000 mm for static bending test; 300 mm for impact test

Figure 2 — Schematic drawing of artificial leg for binding test

6.4 Loading rate

Perform the test quasi-statically, ensuring that the following indicative values of the torque gradient are respected:

a) torsion values: $$\frac{\mathrm{d}M_z}{\mathrm{d}t} \leqslant 50\ \mathrm{N \cdot m/s} \quad (1)$$

b) forward bending value: $$\frac{\mathrm{d}M_y}{\mathrm{d}t} \leqslant 220\ \mathrm{N \cdot m/s} \quad (2)$$

c) lateral bending: $$\frac{\mathrm{d}M_x}{\mathrm{d}t} \leqslant 50\ \mathrm{N \cdot m/s} \quad (3)$$

where

M is the torque in the x, y or z direction in newton metres;

t is the time of load application in seconds.

6.5 Accuracy of measurement

The measurement error of the value in torsion and in forward bending shall be no more than ± 2 %.

The test equipment shall be designed to allow application of a torque (see Table 1) with a force applied at the upper part of the 1 m shaft connected to the artificial leg (see Figure 2).

6.6 Testing under icy conditions

6.6.1 Step-in function with a frozen binding

With mounted snowboard binding ready to be stepped into but without boot, shower the snowboard in a horizontal position for 2 min with water at (23 ± 5) °C, then position it vertically for about 1 min to remove excess water. Finally, cool horizontally to – 20 °C and store for at least 30 min.

Test the function by performing the step-in function with the boot on the artificial leg.

6.6.2 Step-in release function with a frozen binding

With mounted snowboard binding with stepped-in boot, shower the snowboard in a horizontal position for 2 min with water at (23 ± 5) °C, then position it vertically for about 1 min to remove excess water. Finally, cool horizontally to – 20 °C and store for at least 30 min.

Test the function by removing the boot with the artificial leg.

Table 1 — Direction and torque

Direction	Type A	Type C
$\pm M_z$	150 N·m	100 N·m
$\pm M_y$	300 N·m	180 N·m
$\pm M_x$	150 N·m	80 N·m
NOTE These loads are in line with the predicted loads for riding under carving conditions. They do not consider the effects of falling, impact, jumping, half pipe or terrain parks.		

6.7 Mechanical testing

6.7.1 False positive lock and clearance

Place a (2 ± 0,1) mm thick shim of polyethylene, roughly the same shape as the outsole under the boot and verify that the step-in function still works as per the manufacturer's instructions. Insert the boot into the binding and perform the static bending tests described in 6.7.2.

6.7.2 Static bending tests

Mount the snowboard binding on the rigid plate. Place the foot form in the boot and lace tightly. Mount the boot on the binding and place the entire assembly in the environmental chamber.

After the snowboard binding and mounting plate have been preconditioned, mount the cold fixture in the test frame and apply a moment in accordance with Table 1 in both directions with a cold boot and artificial leg at – 20 °C.

Perform the test in 2 min.