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Alpine skis and bindings — Binding mounting area — Requirements and test methods

Skis et fixations de skis alpins — Zone de montage de la fixation — Exigences de tenue et méthodes d'essai

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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.

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ISO 8364 was prepared by Technical Committee ISO/TC 83, *Sports and recreational equipment*, Subcommittee SC 4, *Skis and snowboards*.

This fourth edition cancels and replaces the third edition (ISO 8364:1999), which has been technically revised.

Alpine skis and bindings — Binding mounting area — Requirements and test methods

1 Scope

This International Standard specifies requirements and test methods for the binding mounting area and free space area, ski bindings and retention devices of alpine skis, in order to optimize the compatibility of the functional unit "ski binding — retention device — boot".

It contains data for the manufacturer of alpine skis, bindings and retention devices, concerning dimensions, tests and other specifications for the binding mounting area.

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 4287:1997, *Geometrical Product Specifications (GPS) — Surface texture: Profile method — Terms, definitions and surface texture parameters*

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

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

ISO 6289, *Skis — Vocabulary*

ISO 6506:2005 (all parts), *Metallic materials — Brinell hardness test*

ISO 10045, *Alpine skis — Binding mounting area — Requirements for test screws*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 6289 and the following apply.

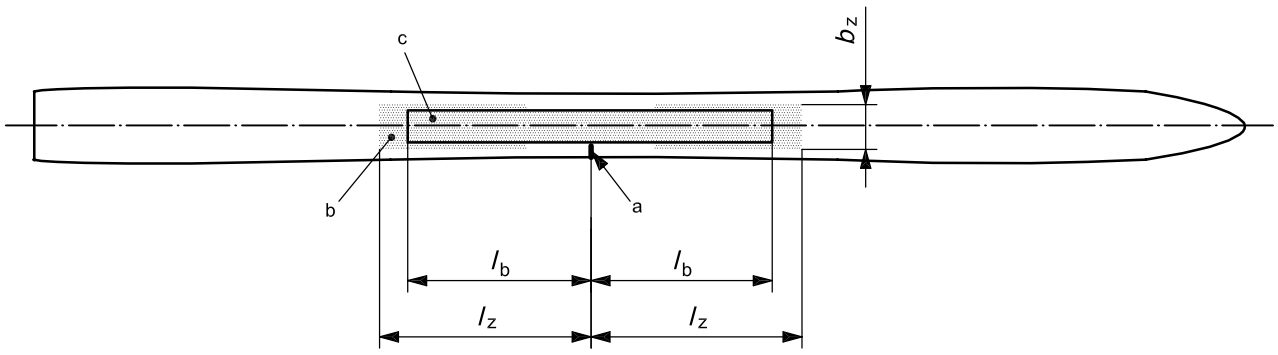
3.1
mounting point
location on the ski that indicates the position of the boot along the length of the ski for the purpose of mounting the binding, and which corresponds to the boot sole mark established by ISO 5355 for alpine ski-boots

3.2
free space area
area forward and backward from the mounting point, fulfilling minimum flatness requirements in accordance with Clause 5

See Figure 1.

3.3
binding mounting area
area forward and backward from the mounting point, fulfilling minimum strength requirements in accordance with Clause 7

See Figure 1.



Key

l_b length of binding mounting area
l_z length of free space area
b_z width of the free space area

a Mounting point.
b Free space area.
c Binding mounting area (width in accordance with 6.2).

Figure 1 — Free space and binding mounting areas

4 Specifications of free space area

4.1 Length of free space area (l_z)

The length of the free space area forward and backward from the mounting point shall be according to the values given in Table 1.

Table 1 — Length of free space area

Group	Length of free space area forward and backward from the mounting point mm
1	300
2	270
3	210
4	190

4.2 Width of the free space area (b_z)

The minimum width of the free space area shall be as follows:

— For Groups 1 and 2:

  48 mm within an area 100 mm forward and 100 mm backward from the mounting point;

  53 mm in the remaining part of the free space area.

— For Group 3:

  48 mm within an area 100 mm forward and 100 mm backward from the mounting point;

  53 mm in the remaining part of the free space area.

— For Group 4:

  46 mm within an area 100 mm forward and 100 mm backward from the mounting point;

  50 mm in the remaining part of the free space area.

5 Geometrical requirements of free space area

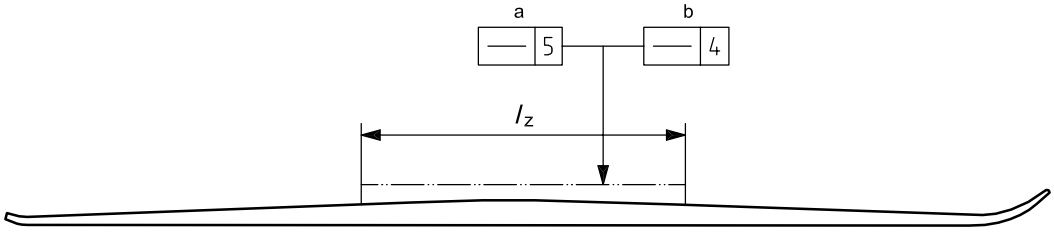
5.1 Longitudinal profile of the ski surface within the free space area

Deviations from the straightness of the longitudinal profile from a flat profile are only permissible in the form of a constant curve in the length of the free space area; the tolerance on straightness in this area, the ski base being pressed against a flat surface, is as follows (see Figure 2):

— Groups 1 and 2: 5 mm;

— Groups 3 and 4: 4 mm.

Tolerance in millimetres



Key

l_z length of free space area

a Groups 1 and 2.

b Groups 3 and 4.

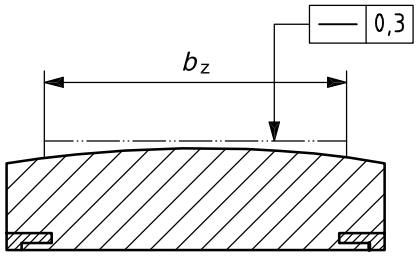
Figure 2 — Longitudinal profile of the surface

Outside the binding mounting area, within the length of the free space area, a maximum downward deviation of 2 mm from the constant curve is permissible.

5.2 Transverse profile of the ski surface within the free space area

Deviations of straightness of the transverse profile from the flat profile are only permissible in the form of a constant curve across the width of the free space area; the tolerance on straightness within this area is given in Figure 3.

Tolerance in millimetres



Key

b_z width of free space area

Figure 3 — Transverse profile of the structure

Beyond the free space area, on the remaining width of the ski, there shall be no elevation beyond the surface of the free space area.

6 Specifications of binding mounting area

6.1 Length of binding mounting area (l_b)

The length of the binding mounting area forward and backward from the mounting point shall be in accordance with the values given in Table 2.

Table 2 — Length of binding mounting area

Group	Length of binding mounting area forward and backward from the mounting point mm
1	285
2	240
3	210
4	190

6.2 Width of binding mounting area

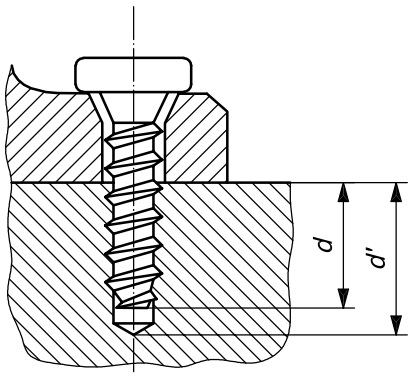
The width of the binding mounting area shall be such that it allows the mounting of alpine ski binding screws of nominal diameter 5,5 mm in accordance with ISO 6004:1991, and respects the retention strength requirements in accordance with 7.1.

6.3 Minimum thickness of binding mounting area

Within the binding mounting area, a drill hole depth, d', shall be available (see Figure 4) as follows:

— Groups 1 and 2: 9,5 mm;

— Groups 3 and 4: 7,5 mm.



Key

d' drill hole depth

d penetration depth

Figure 4 — Penetration depth, d, of mounting screws

7 Strength requirements of binding mounting area

7.1 Screw retention strength (F_r)

Within the binding mounting area, the minimum value of the screw retention strength for two screws, if the load is applied quasi-statically, shall be as follows:

— Group 1: 2 600 N;

— Group 2: 2 600 N;

— Group 3: 1 600 N;

— Group 4: 1 300 N.

7.2 Stripping resistance (F_s)

The minimum value of the stripping resistance of the ski shall be 5 N·m for Groups 1 and 2.

NOTE The present state of the art does not allow a stripping resistance of 5 N·m for skis of Groups 3 and 4. It is the responsibility of the ski manufacturer to indicate ski models where caution is required (stripping resistance lower than 5 N·m) when mounting bindings, and to give mounting instructions, such as smaller diameter drilling and manual screwdriving.

8 Specifications of the binding

The hole-pattern shall be in accordance with the geometrical requirements according to 8.1.

8.1 Centre-to-centre distances for binding mounting screws

8.1.1 Maximum centre-to-centre distance

The maximum centre-to-centre distance in transverse orientation of the binding mounting screws shall be as follows:

— Groups 1 and 2: 42,5 mm;

— Groups 3 and 4: 40,5 mm.

8.1.2 Minimum centre-to-centre distance

For screws which are used for mounting of parts of the binding and retention devices, the centre-to-centre distance shall not be less than the following:

— Groups 1 and 2: 25 mm in the longitudinal direction and 20 mm in all other directions;

— Groups 3 and 4: 20 mm in the longitudinal direction and 15 mm in all other directions.

8.2 Penetration depth of binding screws

In order to ensure the required penetration depth, d, the manufacturer of the binding shall select a suitable length of binding screw, so that after mounting of the binding the shaft of the screw penetrates the ski, for

— Groups 1 and 2: $d = (8 \pm 0{,}5)$ mm

— Groups 3 and 4: $d = (6 \pm 0{,}5)$ mm

To avoid damaging the top layers (damage to the adhesive bond) the diameter of mounting plate holes or countersink facing the ski shall not exceed 8 mm, and drill countersink shall be designed in such a way that its penetration into the top surface of the ski does not exceed 0,6 mm.

Alpine ski binding screws in accordance with ISO 6004:1991 shall be used as mounting elements.

9 Side walls

Side walls shall be designed so that mounting of the binding with commonly used mounting devices is ensured. The basic requirement is that the clamping elements of the mounting device reach at least to the running surface of the ski.

10 Marking

10.1 Marking of the mounting point

A clearly visible mark shall be located on the left side or the top surface of the ski, up to the outer edge for the mounting of the binding. Unless otherwise specified by the ski manufacturer, this mark defines the mounting point in accordance with 3.1.

10.2 Marking of the ski properties

A clearly visible mark shall be located on the side or the top surface of the ski.

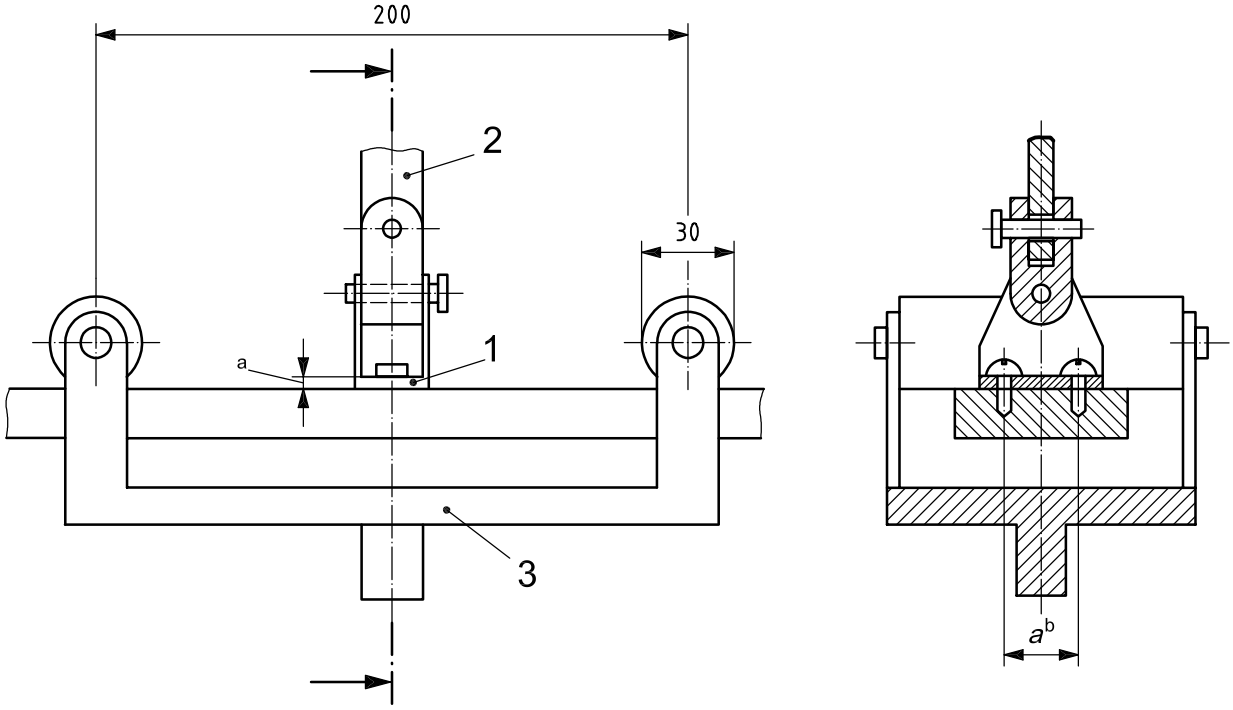
EXAMPLE “G1”

11 Apparatus

11.1 Retention strength

Tensile testing machine (with a pull-out device in accordance with Figure 5) having a minimum load range of 10 000 N.

Dimensions in millimetres



Key

1 steel attachment plate
2 universal joint
3 ski support

a Thickness according to the penetration depth needed.

b a = 25 mm for Groups 1 and 2; a = 20 mm for Groups 3 and 4.

Figure 5 — Tensile testing machine with pull-out device

The pull-out device (see Figure 5) shall consist of the following components:

a) a steel attachment plate with two holes of diameter 6 mm; the steel hardness shall be 135 HB30 in accordance with ISO 6506:2005;

b) a universal joint which is connected to the attachment plate and to the clamping device of the test machine;

c) a ski support with two support rollers.

When using standard test screws in accordance with Clause 12, the following penetration depths, d, shall be reached:

— Groups 1 and 2: d = (8 ± 0,5) mm;

— Groups 3 and 4: d = (6 ± 0,5) mm.

11.2 Stripping resistance

Template, used with a drill bushing, for drilling holes, mounting test screws and determination of stripping torque (see Figure 6 and 13.3.1).

The jig is equipped with a friction plate made of steel with hardness of approximately 135 HB30 in accordance with ISO 6506:2005, and surface roughness, Ra, of 0,8 µm in accordance with ISO 4287:1997.

When using standard test screws in accordance with Clause 12, the following penetration depths, d, shall be reached:

— Groups 1 and 2: d = (8 ± 0,5) mm;

— Groups 3 and 4: d = (6 ± 0,5) mm.

12 Test screws

The screws used for the retention and stripping tests shall be in accordance with ISO 10045.

13 Test methods

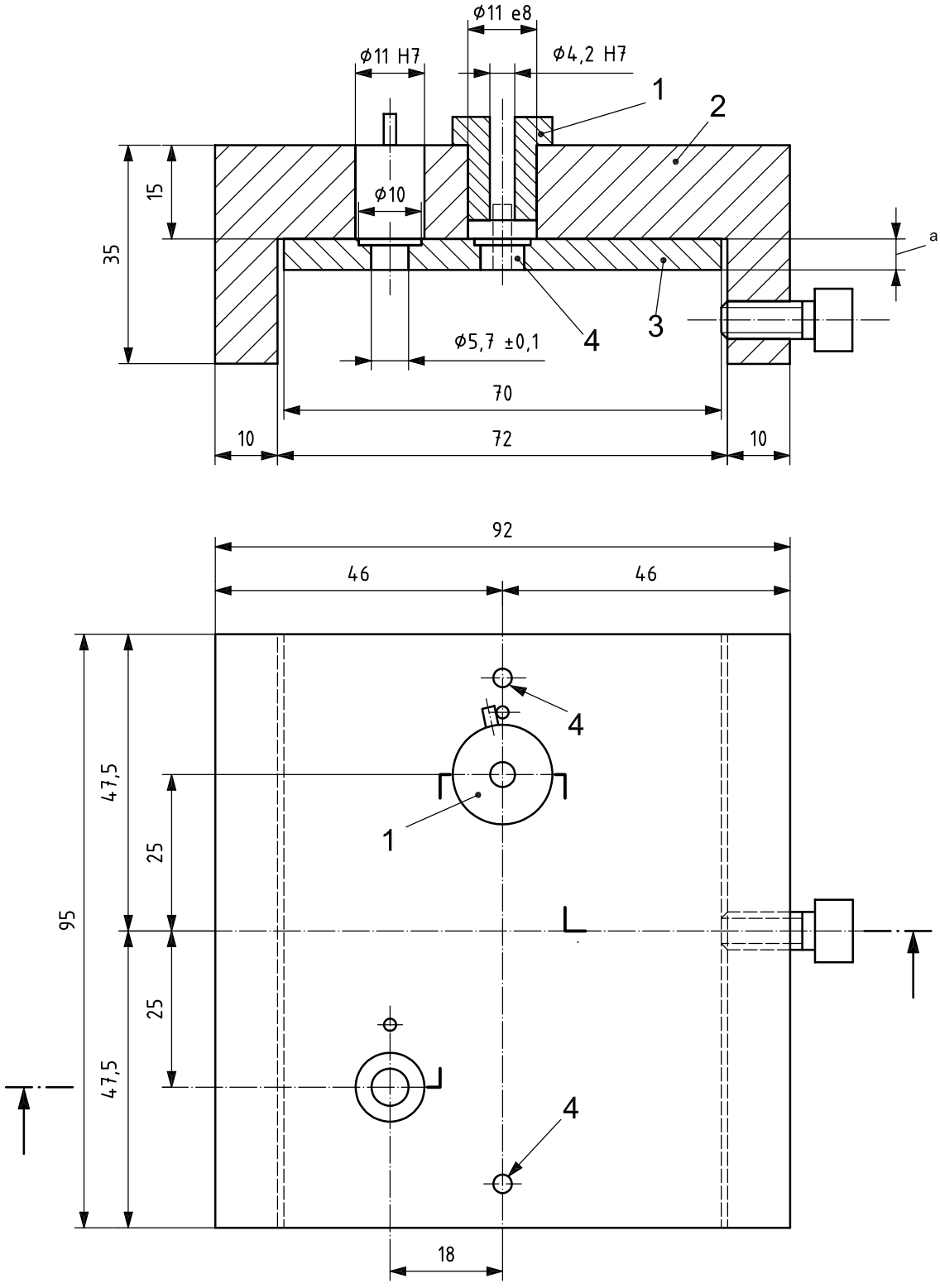
13.1 Sampling and conditioning

Carry out the test on three skis which have been at a room temperature of (23 ± 5) °C for a minimum of 24 h, without specific preconditioning of the ski to be tested.

13.2 General requirements

Test the requirements of Clauses 4 to 6 and Clauses 8 to 10 by measurement and/or sight check.

Dimensions in millimetres



Key

1 drill template bushing
2 drill template
3 friction plate
4 centering pin
a Thickness according to the penetration depth needed.

Figure 6 — Drill and test template

13.3 Retention strength test

13.3.1 Mounting of the attachment plate

It is recommended that a drill template be used to ensure exact drill holes, perpendicular to the top surface of the ski, and at the exact distance apart.

Ensure that the dimensions of the drill holes are as follows:

— drill hole diameter: 4,1 mm H12 or 3,6 mm H12

If a drill hole diameter of 3,6 mm is to be used, it shall be indicated on the ski by the manufacturer.

The depth of the drill hole, d', shall be as follows:

— Groups 1 and 2: $9^{+0,5}_{0}$ mm;

— Groups 3 and 4: $7^{+0,5}_{0}$ mm.

Ensure that the drill countersink is in accordance with 8.2, and that the screws are mounted perpendicular to the top surface of the ski in accordance with the ski manufacturer's instructions for mounting the binding.

The tightening torque shall be as follows:

— Groups 1 and 2: $(4 \pm 0,5)$ N·m;

— Groups 3 and 4: $(3 \pm 0,5)$ N·m.

13.3.2 Positioning of the pull-out tests within the binding mounting area

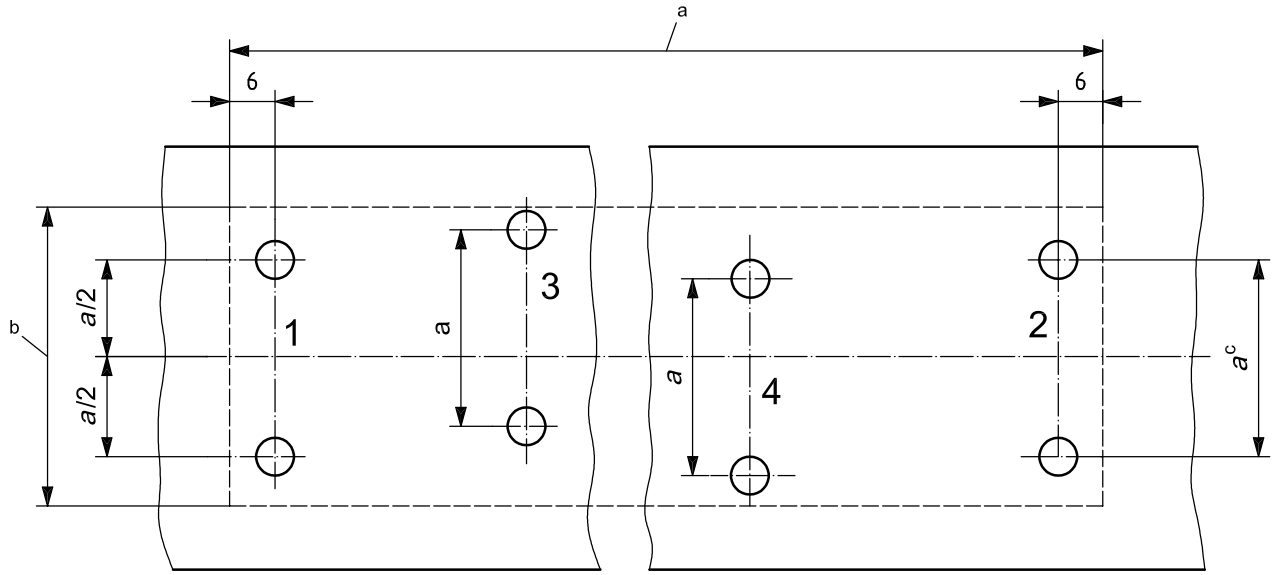
The location of the pull-out tests within binding mounting area is shown in Figure 7. Locations 1 and 2 are those which are specified by this International Standard. Choose locations 3 and 4 at random, but ensure that the distance with respect to the side of the mounting area is as specified in Figure 7. The minimum spacing in the longitudinal direction is as follows:

— Groups 1 and 2: $a = 25$ mm;

— Groups 3 and 4: $a = 20$ mm.

Ensure that the tests are not influenced by the preceding tests. No future test shall be run within 50 mm of a delimitated area.

Dimensions in millimetres



Key

1 to 4 locations of pull-out tests

a Length of the binding mounting area (see Table 2).

b Width of the binding mounting area (see 6.2).

c a = 25 mm for Groups 1 and 2; a = 20 mm for Groups 3 and 4.

Figure 7 — Positioning of the pull-out tests within the binding mounting area

13.3.3 Load application

Ensure that the loading rate is quasi-static, not more than 20 mm/min. Measure the maximum load which is applied during the load application. Measuring accuracy: ± 50 N.

13.4 Stripping resistance test

13.4.1 Use the test template with a drill bushing to drill a hole with a diameter of 4,1 mm H12 (or 3,6 mm if marked on the ski by the ski manufacturer) and the following drill hole depth:

— Groups 1 and 2: 8,5 mm;

— Groups 3 and 4: 6,5 mm.

13.4.2 Mount and tighten the test screw, always with the test template as a guide, without the drill bushing. Apply an increasing torque with a torque-wrench screwdriver until a drop of the torque resistance indicates failure of the thread.

Ensure that the vertical force applied to the screw-driver is less than 500 N.

Carry out the test with a minimum of 10 different screws of the same type.

Use a new hole in the friction plate for each test.

14 Test report

The test report shall include the following information:

a) a reference to this International Standard;

b) the ski brand, model designation, nominal length, year of manufacture and serial number;

c) the characteristics of the testing machine: type, load range and loading rate;

d) a sketch showing locations 1, 2, 3 and 4;

e) the test results of three skis and type of failure for Groups 1, 2, 3 and 4, respectively;

f) the test results of stripping resistance on three skis;

g) any deviation from this International Standard and the reasons for this deviation.

Annex A
(informative)

Synoptic tables

Table A.1 — Overview of the most important parameters

Group	l_b [a] mm	l_z [b] mm	b_z [c] mm	d' [d] mm	d [e] mm	F_r [f] N	F_s [g] N·m
1	285	300	48/53	9,5	$8 \pm 0,5$	2600	5
2	240	270	48/53	9,5	$8 \pm 0,5$	2600	5
3	210	210	48/53	7,5	$6 \pm 0,5$	1600	5 [h]
4	190	190	46/50	7,5	$6 \pm 0,5$	1300	5 [h]

[a] l_b = length of binding mounting area forward and backward from the mounting point (see 6.1).

[b] l_z = length of free space area forward and backward from the mounting point (see 4.1).

[c] b_z = width of the free space area (see 4.2).

[d] d' = drill hole depth (see 6.3).

[e] d = penetration depth of binding screws (see 8.2).

[f] F_r = screw retention strength (see 7.1).

[g] F_s = stripping resistance (see 7.2).

[h] The present state of the art does not allow a stripping resistance of 5 N·m for skis of Groups 3 and 4. It is the responsibility of the ski manufacturer to indicate ski models where caution is required (stripping resistance lower than 5 N·m) when mounting bindings, and to give mounting instructions, such as smaller diameter drilling and manual screwdriving.

Table A.2 — Correlation between ski classification and skier's mass

Group	Skier's mass kg
1	> 65
1, 2	$\leqslant 65$
1, 2, 3	$\leqslant 45$
(1, 2) 3, 4	$\leqslant 25$
In order to guarantee sufficient safety parameters (e.g. screw retention strength), skiers should use skis, approximately of the appropriate Group (1 to 4), according to the skier's mass.	

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Price based on 13 pages