

INTERNATIONAL STANDARD

ISO
6005

Second edition
1991-12-01

Alpine skis — Ski binding screws — Test methods

Skis alpins — Vis de fixation de skis — Méthodes d'essai



Reference number
ISO 6005:1991(E)

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.

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.

International Standard ISO 6005 was prepared by Technical Committee ISO/TC 83, *Sports and recreational equipment*, Sub-Committee SC 4, *Skis and snowboards*.

This second edition cancels and replaces the first edition (ISO 6005:1981), of which it constitutes a technical revision.

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Alpine skis — Ski binding screws — Test methods

1 Scope

This International Standard specifies test methods for screws used for fastening ski bindings to alpine skis.

Acceptance criteria are specified in ISO 6004.

The results of these test methods characterize only the properties of the binding screw and give no information about the actual mounting and fastening characteristics of different ski models. A test method for these characteristics is specified in ISO 8364.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 1302:1991¹⁾, *Technical drawings — Method of indicating surface texture*.

ISO 2632-1:1985, *Roughness comparison specimens — Part 1: Turned, ground, bored, milled, shaped and planed*.

ISO 3506:1979, *Corrosion-resistant stainless steel fasteners — Specifications*.

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

ISO 6506:1981, *Metallic materials — Hardness test — Brinell test*.

ISO 8364:1991, *Alpine skis and bindings — Binding mounting area — Requirements and test methods*.

3 Definitions

For the purposes of this International Standard, the definitions given in ISO 6004 apply.

4 Apparatus

4.1 Fixation for ductility test

The assembly shall be made in a manner which does not damage the screw threads; at least two complete threads shall overlap the assembly.

4.2 Test assembly

For the purpose of this test, it is necessary to prepare test assemblies representative of material configurations commonly used in ski construction and having dimensions similar to those of a cross-section of the binding mounting area of an alpine ski.

4.2.1 Dimensions and material configuration

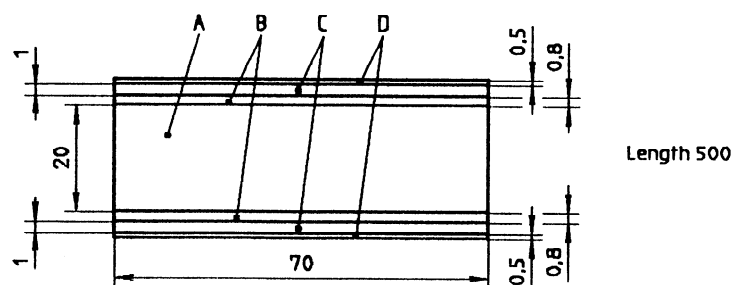
Dimensions:

- length: 500 mm;
- width: 70 mm;
- thickness of core: 20 mm.

See figure 1 for the design of the test assembly.

1) To be published.

Dimensions in millimetres

**Key**

- A** 20 mm thick core, of rigid polyurethane foam, of volumetric mass¹⁾
 $\rho = 0,5 \text{ g/cm}^3 \pm 0,05 \text{ g/cm}^3$, without skin
- B** 0,8 mm thick layers, of glass fibre reinforced epoxy laminate²⁾ finished by sanding (60 grit) on both sides (each layer shall consist of four layers of cloth, each having a mass per unit area of 300 g/m^2 , and shall have a glass fibre orientation of 55 % longitudinally and 45 % transversely and a glass content of approximately 65 %)
- C** 1 mm thick layers, of aluminium alloy, Al-Zn6MgCu, having a minimum tensile strength of 600 N/mm^2 (both sides shall be sandblasted or etched)
- D** 0,5 mm thick layers, of acrylonitrile/butadiene/styrene (ABS) plastics material

1) The density of the polyurethane foam shall be measured before bonding.

2) Details of a suitable laminate may be obtained from the Secretariat of ISO/TC 83/SC 4 (ON, Austria) or from the ISO Central Secretariat.

Figure 1 — Dimensions and design of the test assembly

4.2.2 Preparation of test assemblies

In order to avoid non-uniform surface zones due to the density gradient in the hardened polyurethane foam, the 20 mm thick core shall be cut from a block having a thickness of 30 mm and from which the material is removed symmetrically.

Each layer of the test assembly (see figure 1 and 4.2.1) shall be bonded using Araldite 136²⁾ and Hardener XB 3049²⁾ under the following conditions:

- temperature: $100 \text{ }^\circ\text{C}$;
- pressure: $700 \text{ kPa} \pm 100 \text{ kPa}$;
- curing time: 15 min.

Assemblies shall be cooled under pressure and allowed to age for 1 month prior to use for testing.

4.2.3 Forms of test assembly

4.2.3.1 Test assembly M

The test assembly shall consist of a core A and three discrete layers B, C, D on each side of the core (see figure 1).

4.2.3.2 Test assembly P

The test assembly shall consist of a core A and two discrete layers B, D on each side of the core.

4.3 Drill and test jig

A jig, as shown in figure 2, shall be used for drilling the holes and also for determining the driving torque and the stripping torque. The jig shall ensure an exact drill hole of diameter 4,1 mm, perpendicular to the top surface of the test assembly, and a minimum distance of 50 mm between the holes. It shall also ensure that the test screw is set and mounted

2) Araldite 136 and Hardener XB 3049 are examples of suitable products available commercially. This information is given for the convenience of users of this International Standard and does not constitute an endorsement by ISO of these products.

perpendicular to the top surface of the test assembly.

For each test, a new location of the test jig shall be used.

The drill jig bushing shall be made from hardened steel and shall be fixed against rotation. The friction plate shall be made from steel of hardness 135 (HB 30; see ISO 6506) and shall have a surface roughness of $0,8 \mu\text{m}$ (see ISO 2632-1). The centering pins shall be used to hold the friction plate in place.

For determination of the driving torque and stripping torque, a friction plate (see figures 2 and 3), with a thickness in accordance with the penetration depth needed, shall be used.

4.4 Pull-out apparatus (see figure 4)

Two rolls, of diameter 30 mm and 250 mm apart, shall be used to support the test assembly together with an attachment plate (see figure 4) which permits penetration by the test screw to a depth of 8,5 mm in the test assembly (see also ISO 8364).

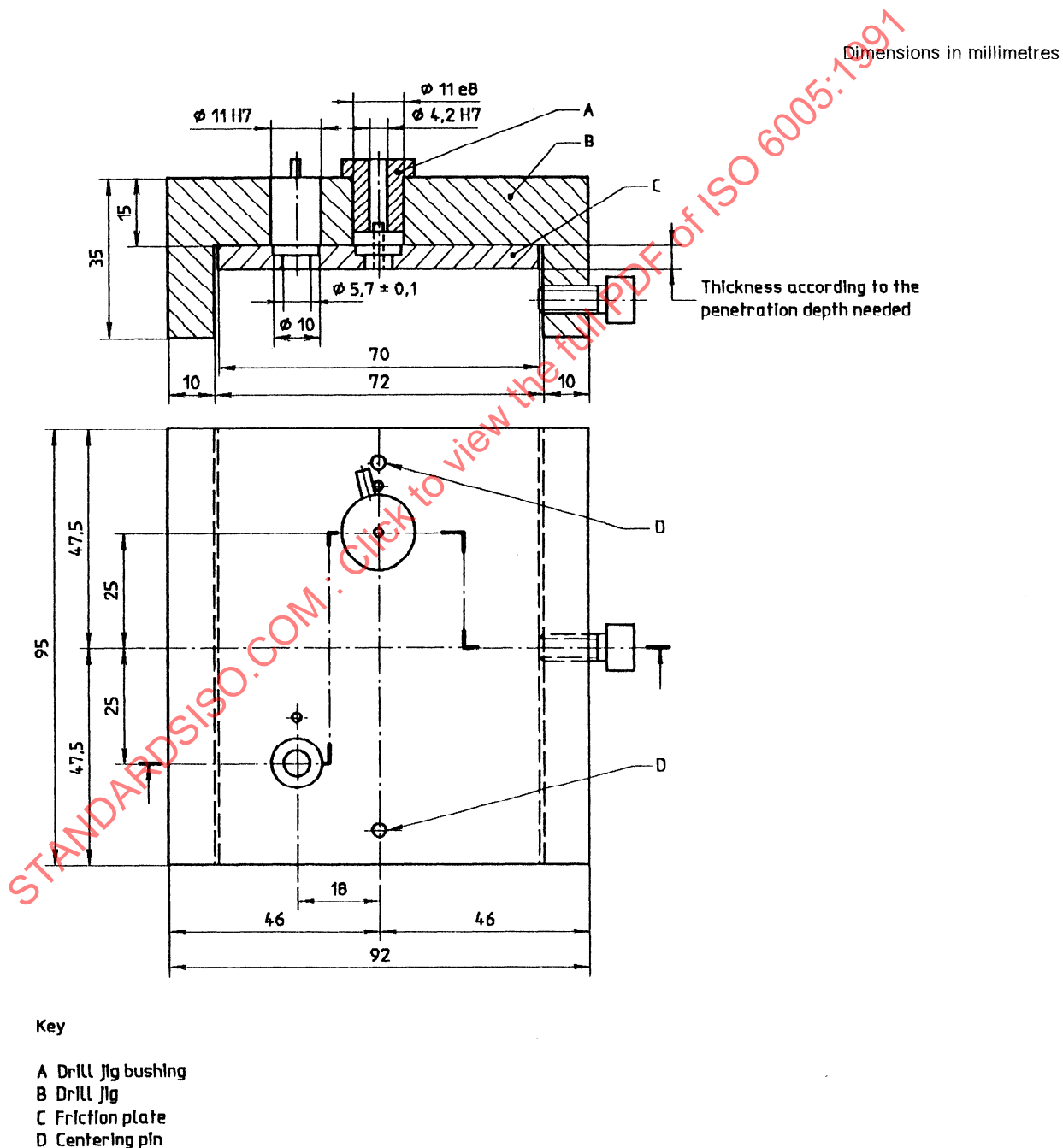


Figure 2 — Drill and test jig

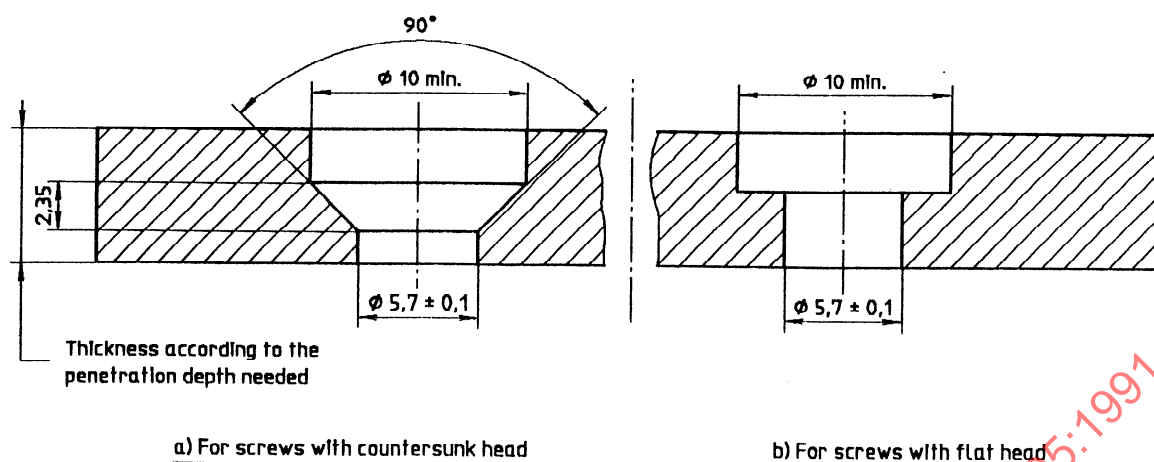


Figure 3 — Friction plate

5 Procedure

5.1 Determination of the breaking moment

Test method in accordance with ISO 3506.

5.2 Ductility test

Drive the screw to be tested into an assembly specified in 4.1.

Using a hammer, strike the edge of the screw head with several lateral blows until a deformation of 10° is obtained.

NOTE 1 This method is not a suitable control for hydrogen embrittlement, for which a test method will be the subject of a future International Standard.

5.3 Determination of the driving torque

5.3.1 Using the drill jig, drill a hole of diameter 4,1 H12 ($+0,12$ mm) and depth ($9^{+0,5}$ mm) in test assembly M. The hole shall not be tapped.

5.3.2 Drive the screw to be tested into the hole, using the test jig and a suitable torque wrench screwdriver. Read the driving torque after each half rotation. No lubrication shall be used during this procedure and the maximum penetration without contact of the screw head and the distance plate shall be $8 \text{ mm} \pm 0,2 \text{ mm}$.

5.3.3 Record the maximum driving torque, in newton metres, as the largest measured value of the torque applied during the driving procedure.

5.3.4 Repeat the test, using at least ten screws.

5.4 Determination of the stripping torque

5.4.1 Using the drill jig, drill a hole of diameter 4,1 H12 ($+0,12$ mm) and depth ($7^{+0,5}$ mm) in test assembly P. The hole shall not be tapped.

5.4.2 Use the test jig to mount and tighten the screws. Apply an increasing torque with the torque wrench screwdriver until a drop in the torque resistance indicates failure of the thread. The maximum penetration depth shall be $6 \text{ mm} \pm 0,2 \text{ mm}$.

5.4.3 Record the stripping torque, in newton metres, as the maximum value of the moment read on the torque wrench screwdriver.

5.4.4 Repeat the test, using at least ten screws.

5.5 Static pull-out test

5.5.1 Using the drill jig, drill holes of diameter 4,1 H12 ($+0,12$ mm) and depth ($9^{+0,5}$ mm) in test assembly P, ensuring that the holes are at least 50 mm apart.

5.5.2 Use the pull-out apparatus described in 4.4 (see figure 4), which allows the introduction of the screw perpendicular to the surface of the test assembly to a penetration depth of $8 \text{ mm} \pm 0,5 \text{ mm}$, and an axial load of the screw perpendicular to the surface of the test assembly during the pull-out test.

Use a maximum tightening torque of 4 N·m.

Position the test assembly such that the test screw is equidistant from the support rolls.

5.5.3 Apply a load at a rate of 20 mm/min until the screw is pulled from the test assembly. Record the maximum load required.

5.5.4 Repeat the test, using at least ten screws.

6 Test report

The test report shall include the following information:

- a) the name of the manufacturer or sign;
- b) designation of type of screw;
- c) maximum driving torque;
- d) maximum stripping torque;
- e) maximum pull-out strength;
- f) any deviation from this International Standard and reasons for this deviation.

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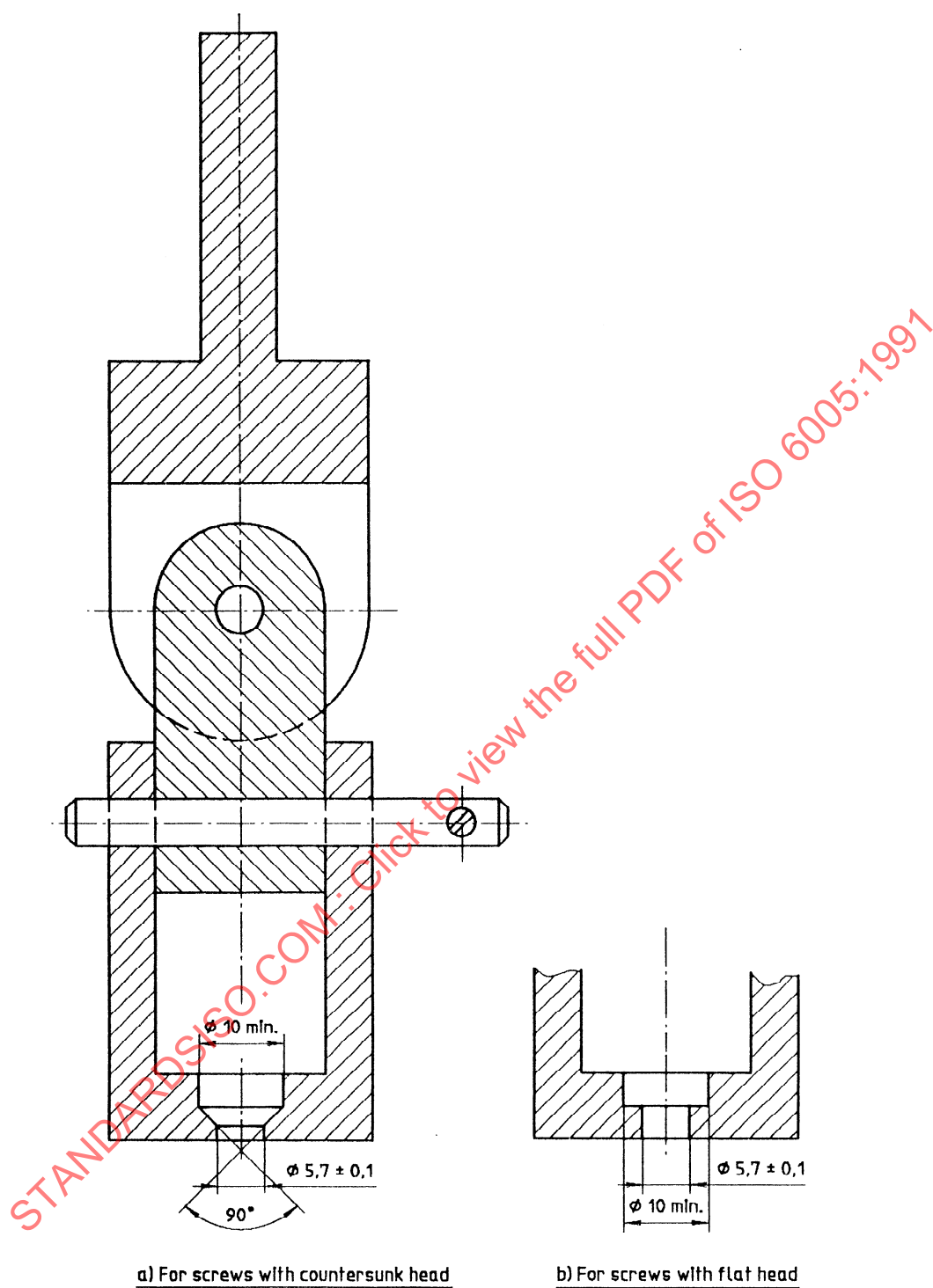


Figure 4 — Pull-out apparatus

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