International Standard 6005

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Alpine skis — Ski binding screws — Test methods

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

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Foreword

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Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 6005 was developed by Technical Committee ISO/TC 83, *Sports and recreational equipment*, and was circulated to the member bodies in January 1980.

It has been approved by the member bodies of the following countries :

Austria	Italy	Switzerland
France	Netherlands	USSR
Germany, F. R.	Poland	
India	Spain	

No member body expressed disapproval of the document.

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Alpine skis — Ski binding screws — Test methods

1 Scope and field of application

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

Acceptance criteria are specified in ISO 6004.

The results of these methods of test characterize only the properties of the binding screw and give no information about the actual mounting and fastening characteristics of different ski models. A method of test for these characteristics is specified in ISO 6006.

2 References

ISO/R 827, *Mechanical property limits for extruded products of aluminium and aluminium alloys.*

ISO 1302, *Technical drawings — Method of indicating surface texture on drawings.*

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

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

ISO 6006, *Alpine skis — Binding mounting area — Strength requirements and test method.*

ISO 6506, *Brinell hardness test for steel and cast iron.*[1)]

ISO 7085, *Thread rolling screws — Mechanical performance.*[1)]

3 Definitions

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

4 Test screw

The test screw shall be in accordance with ISO 6004, having a length of 12 mm.

5 Apparatus

5.1 Fixation for ductility test

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

1) At present at the stage of draft.

5.2 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.

5.2.1 Dimensions and material configuration

See figure 1 .

5.2.2 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 5.2.1) shall be bonded using Araldite 136 and Hardener 994 under the following conditions :

a) temperature : 100 °C;

b) pressure : 500 ± 100 kPa;

c) curing time : 15 min.

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

5.2.3 Forms of test assembly

5.2.3.1 Test assembly M

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

5.2.3.2 Test assembly P

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

5.3 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 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 distance plate shall be made from steel of hardness HB 30 about 135 and shall have a surface roughness of 0,8 µm. The centering pins shall be used to hold the distance plate in place.

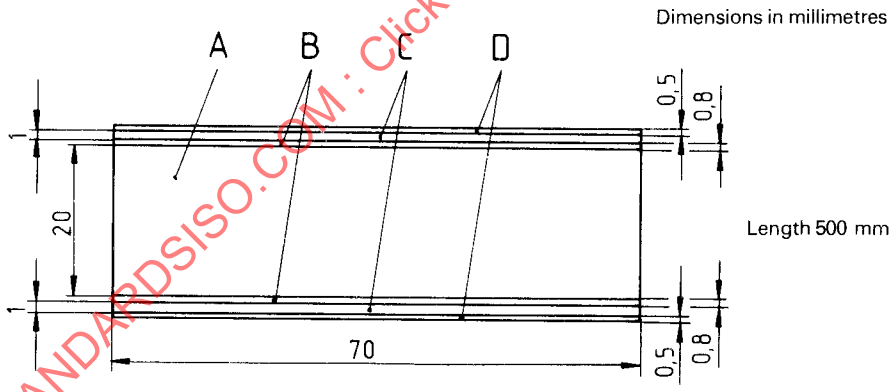

Figure 1 — Dimensions and design of the test assembly

A Core 20 mm thick, of rigid polyurethane foam, of volumetric mass[1] $\varrho = 0,5 \pm 0,05$ g/cm^3, without skin;

B Layers 0,8 mm thick, of glass fibre reinforced epoxy laminate[2] 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 Layers 1,0 mm thick, of aluminium alloy, Al-Zn 6 Mg Cu, complying with the requirements of ISO/R 827 and having a minimum tensile strength of 600 N/mm^2. Both sides shall be sandblasted or etched;

D Layers 0,5 mm thick, 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.

For determination of the driving torque, the distance plate shall have a thickness of 4 mm. For determination of the stripping torque, a plate of thickness 6 mm shall be used.

5.4 Pull-out apparatus

Two rolls, of diameter 30 mm, and 250 mm apart, shall be used to support the test assembly together with an attachment plate which permits penetration by the test screw to a depth of 8 ± 0,2 mm in the test assembly (see also ISO 6006).

Dimensions in millimetres

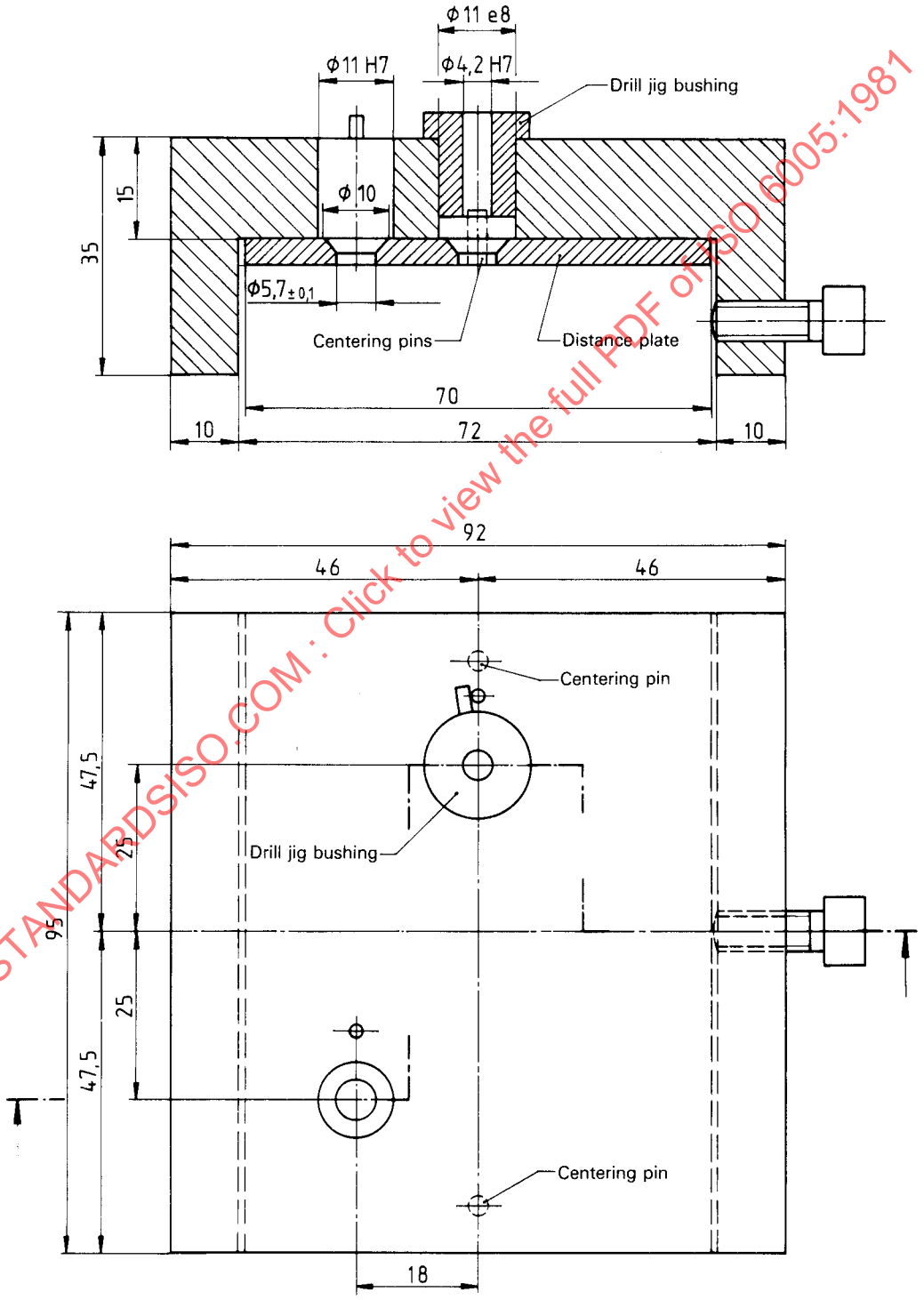

Figure 2 — Drill and test jig

6 Procedure

6.1 Determination of the breaking moment

Determine the breaking moment according to ISO 7085.

6.2 Ductility test[1)]

Drive the test screw into an assembly, specified in 5.1.

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

6.3 Determination of the driving torque

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

6.3.2 Drive the screw 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 7,5 mm.

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

6.3.4 Repeat the test, using at least ten screws.

6.4 Determination of the stripping torque

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

6.4.2 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.

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

6.4.4 Repeat the test, using at least ten screws.

6.5 Static pull-out test

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

6.5.2 Use the pull-out apparatus described in clause 5.4, which allows the introduction of the screw perpendicular to the surface of the test assembly to a penetration depth of 8 ± 0,2 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.

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

6.5.4 Repeat the test, using at least ten screws.

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.