
**Alpine skis — Ski binding screws —
Test methods**

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

STANDARDSISO.COM : Click to view the full PDF of ISO 6005:2019



STANDARDSISO.COM : Click to view the full PDF of ISO 6005:2019



COPYRIGHT PROTECTED DOCUMENT

© ISO 2019

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Fax: +41 22 749 09 47
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

	Page
Foreword	iv
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Apparatus	1
4.1 Fixation for ductility test.....	1
4.2 Test assembly.....	1
4.2.1 Dimensions and material configuration.....	2
4.2.2 Preparation of test assemblies.....	2
4.2.3 Forms and test assembly.....	3
4.3 Drill and test jig.....	3
4.4 Pull-out apparatus.....	5
5 Procedure	6
5.1 Determination of the breaking moment.....	6
5.2 Ductility test.....	6
5.3 Determination of the driving torque.....	7
5.4 Determination of the stripping torque.....	7
5.5 Static pull-out test.....	7
6 Test report	8

STANDARDSISO.COM : Click to view the full PDF of ISO 6005:2019

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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 83, *Sports and other recreational facilities and equipment*, Subcommittee SC 4, *Snowsports equipment*.

This third edition cancels and replaces the second edition (ISO 6005:1991), which has been technically revised. The main changes compared to the previous edition are as follows:

- editorial changes;
- update of the normative references.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Alpine skis — Ski binding screws — Test methods

1 Scope

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

NOTE 1 Acceptance criteria are specified in ISO 6004.

The results of these test methods characterize the properties of the binding screw.

NOTE 2 A test method for the mounting and fastening characteristics of different ski models is specified in ISO 8364.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 2702, *Heat-treated steel tapping screws — Mechanical properties*

ISO 3506-4, *Mechanical properties of corrosion-resistant stainless steel fasteners — Part 4: Tapping screws*

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

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

ISO 6506 (all parts), *Metallic materials — Hardness test — Brinell test*

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

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 6004 apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

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 overtop the assembly.

4.2 Test assembly

For the purpose of this test, test assemblies shall be 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

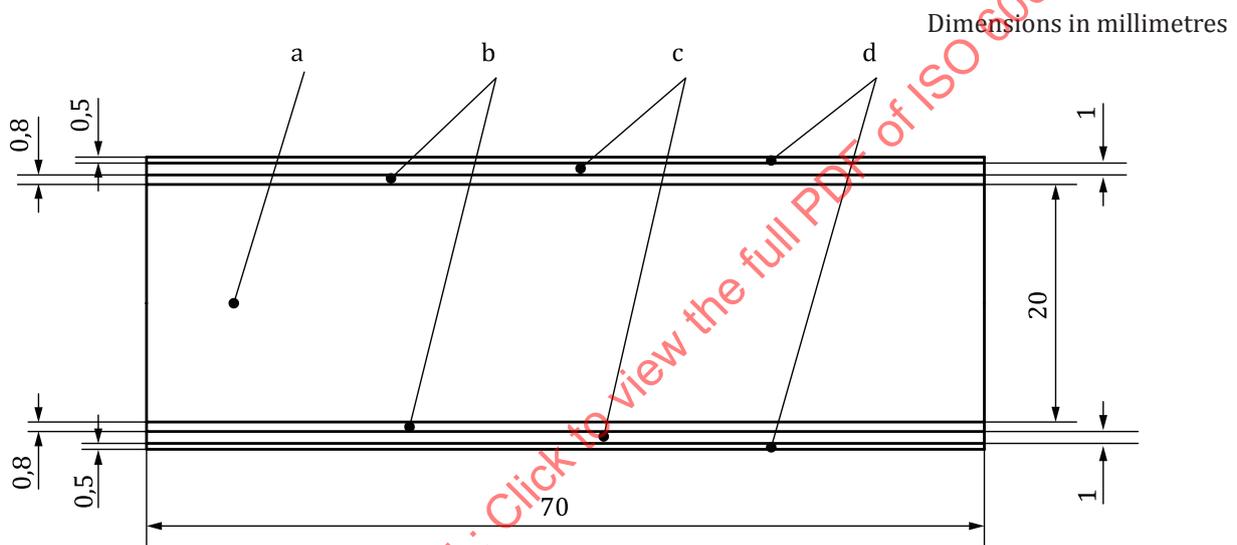
Dimensions:

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

Each layer of the glass fibre reinforced epoxy laminate shall consist of four layers of cloth, each having a mass per unit area of 300 g/m², and shall have a glass fibre orientation of 55 % longitudinally and 45 % transversely and a glass content of approximately 65 %.

Both sides of the aluminium alloy layer shall be sandblasted or etched.

See [Figure 1](#) for the design of the test assembly.



- a 20 mm thick core, of rigid polyurethane foam of voumentric mass $\rho = 0,5 \text{ g/cm}^3 \pm 0,05 \text{ g/cm}^3$, without skin. The density of the polyurethane foam shall be measured before bonding.
- b 0,8 mm thick layers, of glass fibre reinforced epoxy laminate finished by sanding (60 grit) on both sides.
- c 1 mm thick layers, of aluminium alloy, Al-Zn6MgCu, having a minium tensile strength of 600 N/mm².
- d 0,5 mm thick layers, of acrylnotrile/butadiene/styrene (ABS) plastics material.

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 136 and Hardener XB 3049¹⁾ under the following conditions:

- a) temperature: 100 °C;

1) Araldite 136 and Hardener XB 3049 are products supplied by Huntsman. This information is given for the convenience of users of this document and does not constitute an endorsement by ISO of the product named. Equivalent products may be used if they can be shown to lead to the same results.

- b) pressure: 700 kPa \pm 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.

4.2.3 Forms and 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

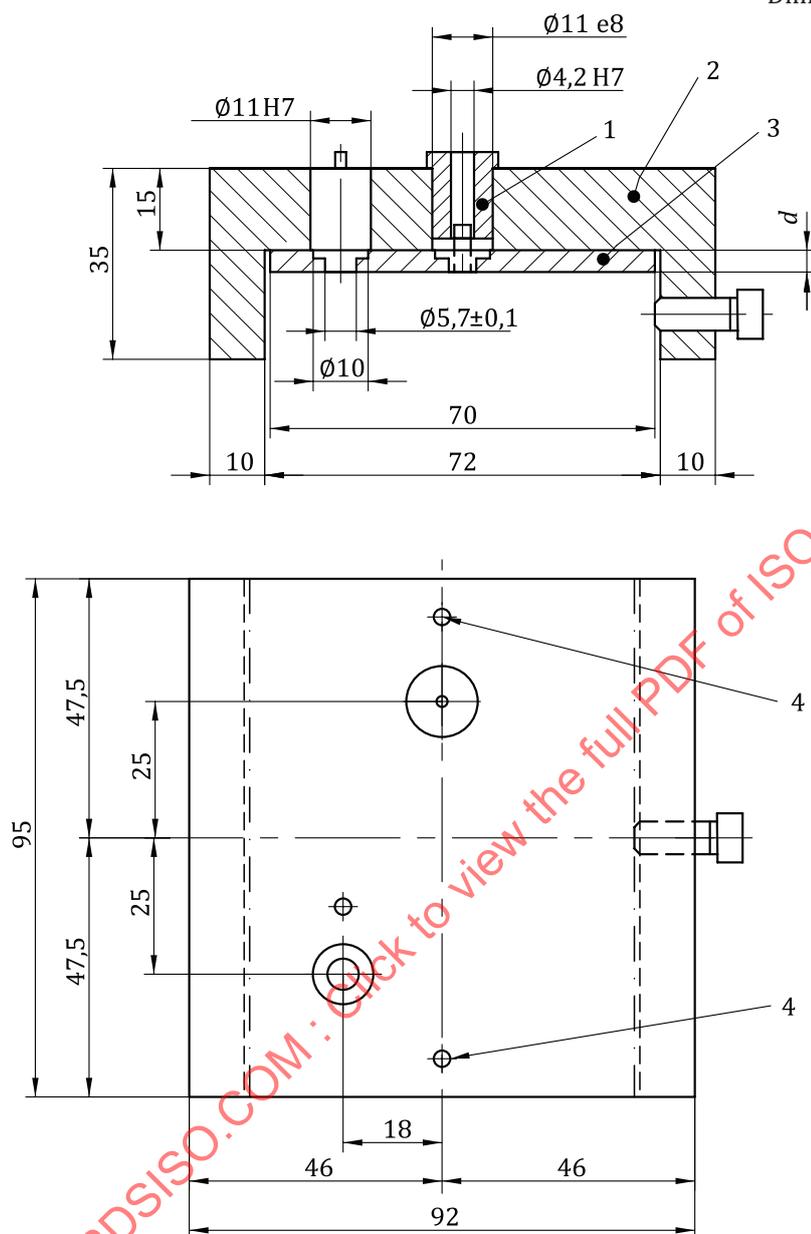
A jig, as shown in [Figure 2](#), shall be used for drilling the holes and for determining the driving torque and the stripping torque. The jig shall ensure an exact drill hole of diameter 4,1 mm, perpendicular to the top surface of the test assembly, and a minimum distance of 50 mm between the holes. 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 friction plate shall be made from steel of hardness 135 (HB 30), in accordance with the ISO 6506 series, and shall have a surface roughness of $Ra = 0,8 \mu\text{m}$, in accordance with ISO 4287. The centering pins shall be used to hold the friction palte in place.

For determination of the driving torque and stripping torque, a friction palte (see [Figure 2](#) and [Figure 3](#)), with a thickness in accordance with the penetration depth needed, shall be used.

Dimensions in millimetres

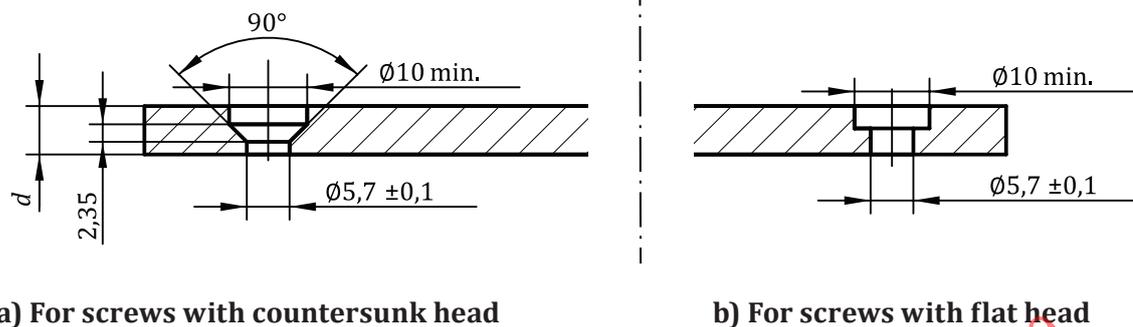


Key

- d* thickness according to the penetration depth needed
- 1 drill jig bushing
- 2 drill jig
- 3 friction plate
- 4 centering pin

Figure 2 — Drill and test jig

Dimensions in millimetres



a) For screws with countersunk head

b) For screws with flat head

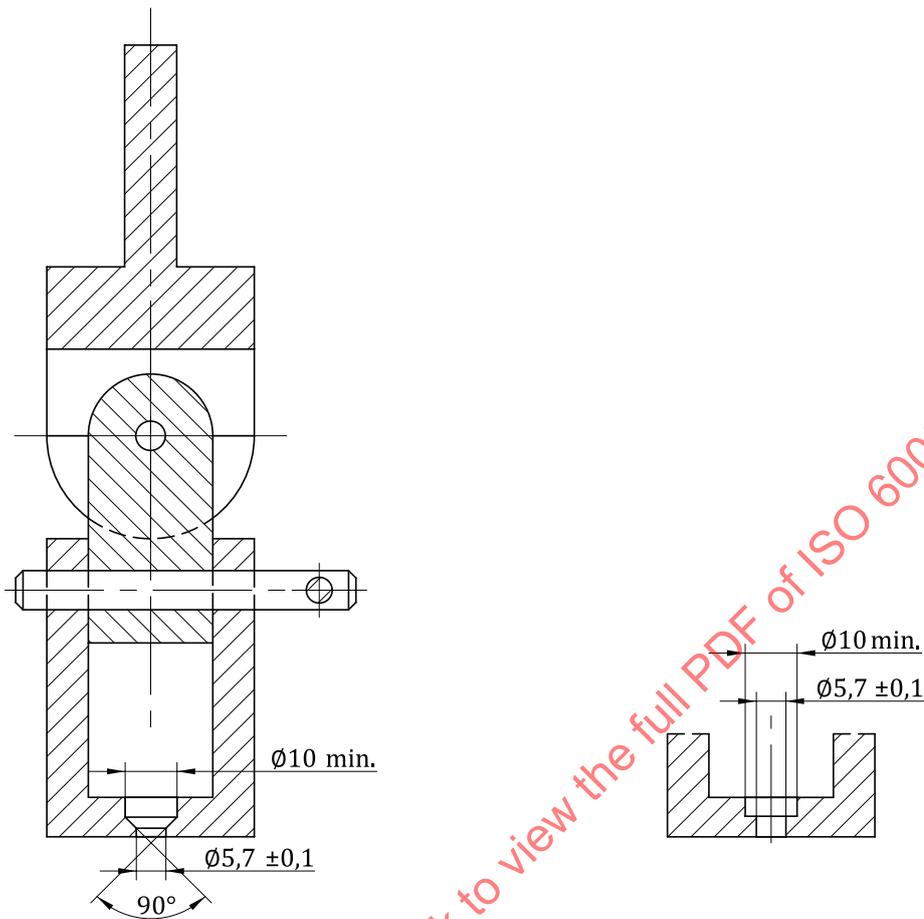
Key

d thickness according to the penetration depth needed

Figure 3 — Friction plate**4.4 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 (see [Figure 4](#)) which permits penetration by the test screw to a depth of 8,5 mm in the test assembly according to ISO 8364.

STANDARDSISO.COM : Click to view the full PDF of ISO 6005:2019



a) For screws with countersunk head

b) For screws with flat head

Figure 4 — Pull-out apparatus

5 Procedure

5.1 Determination of the breaking moment

The test method and minimum torsional strength requirements shall be in accordance with ISO 3506-4 for stainless steel screws and in accordance with ISO 2702 for other steel alloys screws.

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 This method is not a suitable control for hydrogen embrittlement.

5.3 Determination of the driving torque

5.3.1 Using the drill jig, drill a hole of diameter 4,1 H12 $\left(\begin{smallmatrix} +0,12 \\ 0 \end{smallmatrix} \right)$ mm and depth $\left(\begin{smallmatrix} 9^{+0,5} \\ 0 \end{smallmatrix} \right)$ 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 $\left(\begin{smallmatrix} +0,12 \\ 0 \end{smallmatrix} \right)$ mm and depth $\left(\begin{smallmatrix} 7^{+0,5} \\ 0 \end{smallmatrix} \right)$ 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 on the tread. 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 $\left(\begin{smallmatrix} +0,12 \\ 0 \end{smallmatrix} \right)$ mm and depth $\left(\begin{smallmatrix} 9^{+0,5} \\ 0 \end{smallmatrix} \right)$ 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 Nm.

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.