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Cross-country skis — Binding mounting area — Requirements and test methods

*Skis de fond — Zone de montage de la fixation — Spécifications et
méthodes d'essai*



Reference number
ISO 9119:1990(E)

Foreword

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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 9119 was prepared by Technical Committee ISO/TC 83, *Sports and recreational equipment*.

This first edition cancels and replaces ISO 7264:1983, ISO 7265:1984 and ISO 7793:1984.

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Introduction

Standardized dimensions for a binding mounting area enable a ski designer to locate reinforcing elements within this area. Standard dimensions also enable the binding designer to determine all interface dimensions for binding unit size, screw locations, etc. Bindings and skis manufactured in compliance with this International Standard are compatible.

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Cross-country skis — Binding mounting area — Requirements and test methods

1 Scope

1.1 This International Standard specifies requirements and test methods for the binding mounting areas of cross-country skis, within which parts of the toe-clip binding in accordance with ISO 6960 may be mounted. Different values are specified for two groups of nominal ski lengths, l_N :

Group 1: $1\,750\text{ mm} < l_N \leq 2\,200\text{ mm}$

Group 2: $1\,300\text{ mm} \leq l_N \leq 1\,750\text{ mm}$

It specifically excludes alpine skis.

1.2 A designated binding attachment area, or binding mounting area (see 3.1), shall be provided by the ski manufacturer and shall be the only area of the ski subjected to this test.

1.3 This International Standard covers skis the bindings of which are attached by means of screws in area A_1 and screws, nails or other fasteners in areas A_2 and A_3 (see figure 1 and figure 2).

1.4 Using test screws loaded normal to the ski surface, the test methods specified simultaneously evaluate the tendency of

- screws to be pulled out;
- skis to delaminate;
- screw hole threads to strip.

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 6289:1985, *Skis — Terms and definitions*.

ISO 6960:1983, *Cross-country ski bindings with three pins — Dimensions, interface and design*.

ISO 7138:1984, *Cross-country skis — Determination of mass and location of balance point*.

ISO 7794:1984, *Cross-country skis — Ski binding screws — Requirements*.

ISO 7795:1984, *Cross-country skis — Ski binding screws — Test methods*.

ISO 10228:—¹⁾, *Cross-country skis — Binding mounting area — Requirements for test screws*.

3 Definitions

For the purposes of this International Standard, the definitions given in ISO 6289 and the following definitions apply.

3.1 binding mounting area A_1 : Portion of the top surface of the ski which is intended for mounting toe-clip bindings. The standardized binding mounting area establishes the area on the ski within which the entire diameter of binding screws should be placed.

3.2 binding mounting areas A_2 and A_3 : Portions of the top surface of the ski intended for mounting other parts of a binding such as heel support plates. These are the areas on the ski within which the entire diameter of the part attachment fasteners should be placed (see figure 1 and figure 2).

1) To be published.

4 Specifications

4.1 Indication of mounting point

The ski manufacturer is responsible for the proper location of the mounting point on the ski.

The mark of a mounting point shall be a line perpendicular to the axis of the ski, the minimum length being 30 mm. It is permissible to use a scale indicating different mounting points for different boot applications.

If there is no mark on the ski for the mounting point, MP, the balance point, BP, of the ski — defined by placing the ski on a knife-edge fulcrum point — shall be used as a reference point (see ISO 7138). In the case of a difference between two skis of the same pair, the most rearward point shall be used.

4.2 Minimum length of the binding mounting area

4.2.1 Ski lengths from 1 300 mm to 1 750 mm

The minimum length of the binding mounting area for ski lengths l_N , from 1 350 mm to 1 750 mm shall be as shown in figure 1.

Where a mounting scale is used, the area A_1 shall be extended such that there is 40 mm beyond the rear and 70 mm beyond the front limits of the scale.

4.2.2 Ski lengths from 1 750 mm to 2 200 mm

The minimum lengths of the binding mounting area for ski lengths l_N , from 1 750 mm to 2 200 mm shall be as shown in figure 2 and table 1.

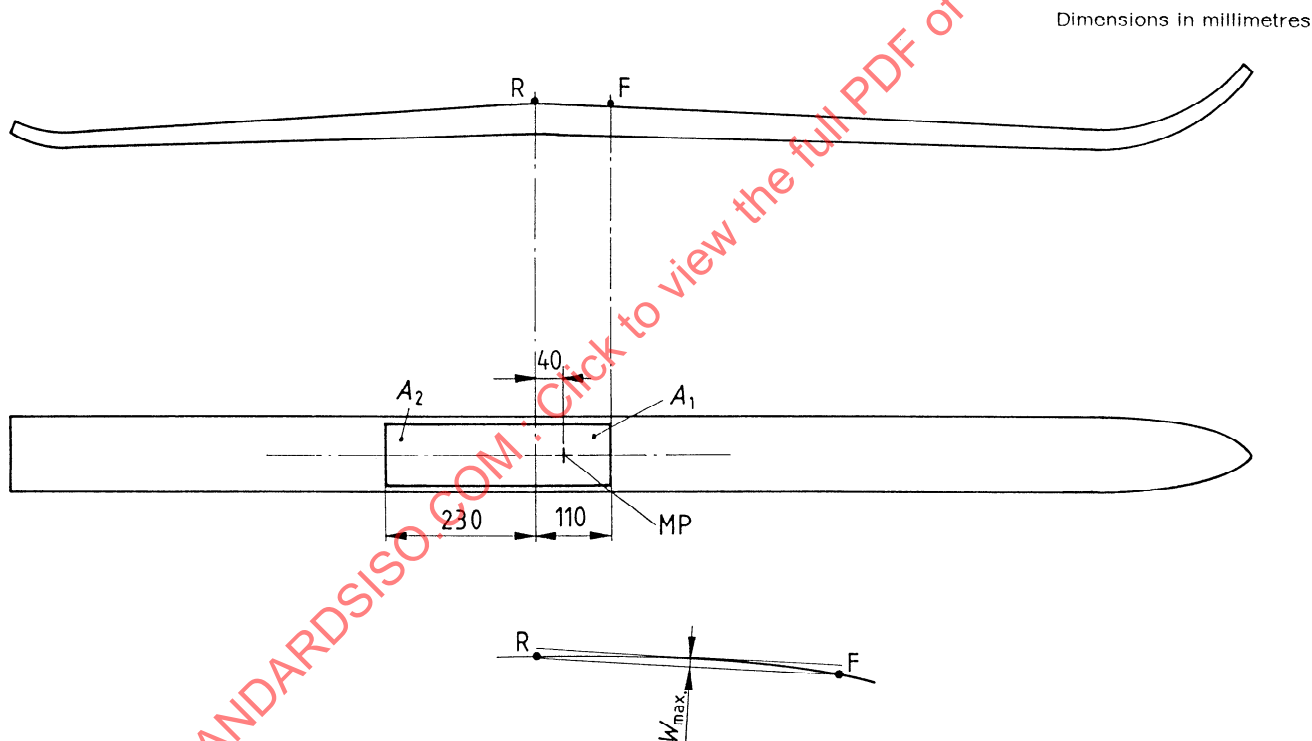


Figure 1 — Minimum length of the binding mounting area for ski lengths l_N , from 1 300 mm to 1 750 mm and curvature of the surface

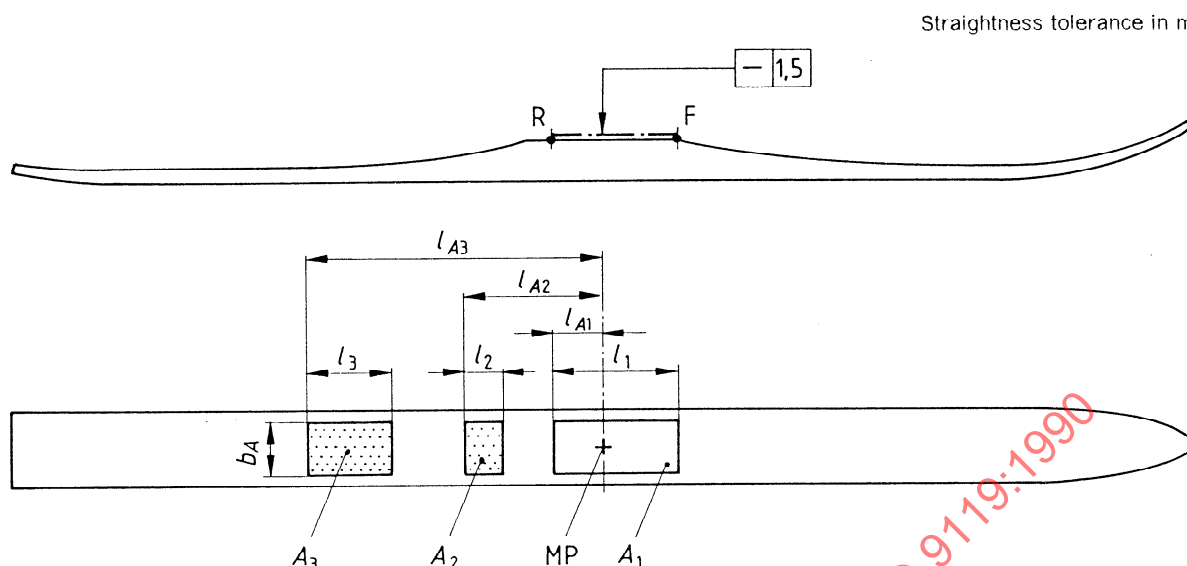


Figure 2 — Minimum length of the binding mounting area for ski lengths l_N from 1750 mm to 2200 mm and curvature of the surface

Table 1 — Minimum lengths of the binding mounting area for nominal ski lengths, l_N , from 1750 mm to 2200 mm

Dimensions in millimetres

Nominal ski length, l_N	Binding mounting area					
	l_{A1}	l_1	l_{A2}	l_2	l_{A3}	l_3
1750	40	110	—	—	245	150
1800	40	110	—	—	245	150
1850	40	110	165	70	275	100
1900	40	110	165	70	285	100
1950	40	110	165	70	285	100
2000	40	110	165	70	295	100
2050	40	110	165	70	300	100
2100	40	110	165	70	315	100
2150	40	110	165	70	325	100
2200	40	110	165	70	325	100

Where a mounting scale is used, the area A_1 shall be extended such that there is 40 mm beyond the rear limit and 70 mm beyond the front limit of the scale.

4.3 Minimum width of the binding mounting area

The minimum width of the binding mounting area, b_A , shall be 33 mm.

Staying within this area requires a binding design such that the centre-to-centre distance between screws perpendicular to the centre-line is less than

26,7 mm, allowing for a 6,3 mm screw diameter and tolerances (see figure 3).

Dimensions in millimetres

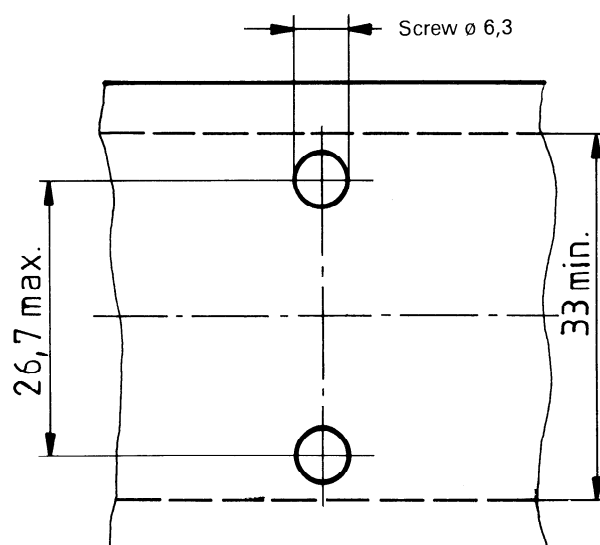


Figure 3 — Minimum width of the binding mounting area

4.4 Minimum thickness of the binding mounting area

The minimum thickness of the total binding mounting area shall be such that the drill hole depth as shown in table 2 and figure 4 is possible.

Table 2 — Minimum thickness of the binding mounting area (drill hole depth)

Dimensions in millimetres

Nominal ski length	Drill hole depth d' , min.
	Area A_1 , A_2 and A_3
Group 1	15,5
Group 2	11,5

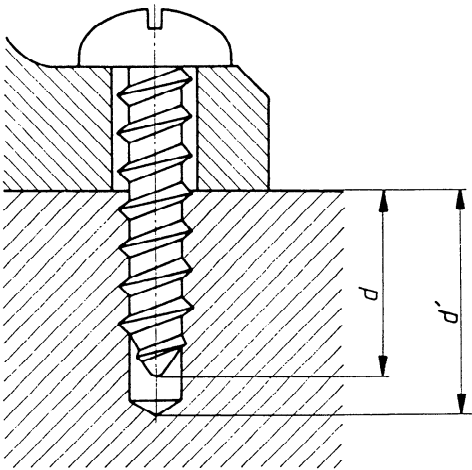


Figure 4 — Drill hole depth

4.5 Surface condition of the binding mounting area

4.5.1 Transverse profile (convexity) of surface

Deviations from straightness of the transverse profile are only permissible in the form of a constant curve across the width of the mounting area; the tolerance on straightness within this area is given in figure 5.

There shall be no step in the profile within a width b_A for all groups symmetrical to the longitudinal axis: outside this area steps are allowed only into the body of the ski.

4.5.2 Longitudinal profile of surface

Deviations from straightness of the longitudinal profile are only permissible in the form of a constant curve in the length of the mounting area; the toler-

ance on straightness in this area, the ski base being pressed against a flat surface, are given for groups 1 and 2 in figure 1 and figure 2 respectively.

5 Strength requirements of the binding mounting area

5.1 Screw retention strength

The values given in table 3 for the penetration depth d and for the screw retention strength $F_{R, min}$ for the screws within the binding mounting area, if the load is applied quasistatically, shall be observed.

5.2 Minimum stripping resistance

The minimum stripping resistance of the ski shall be 3,5 N·m in the areas A_1 , A_2 and A_3 , for groups 1 and 2.

6 Apparatus

6.1 Retention strength

6.1.1 Tensile testing machine, as shown in figure 6, providing a loading rate accuracy of $\pm 20\%$ at a loading rate of 5 mm/min and a load measurement accuracy of $\pm 1\%$ with a minimum load range of 5 000 N.

6.1.2 Test fixture, (see figure 6), consisting of

- a) an attachment element as shown in figure 7 made of cold-rolled steel or equivalent;
- b) a universal joint which is connected to the attachment element and to the clamping device of the test machine (6.1.1);
- c) a ski support with two support rollers 300 mm apart.

The test fixture shall be a self-aligning type (so that no moment is imposed on the screw pattern).

6.2 Stripping resistance.

A jig as shown in figure 8 shall be used to drill holes, mount test screws and determine the stripping torque.

Used with a drill bushing, the jig shall ensure an exact drill hole and screw mounting perpendicular to the top surface of the ski.

The jig is equipped with a friction plate, as shown in figure 9 (for example see ISO 7795).

Straightness tolerance in millimetres

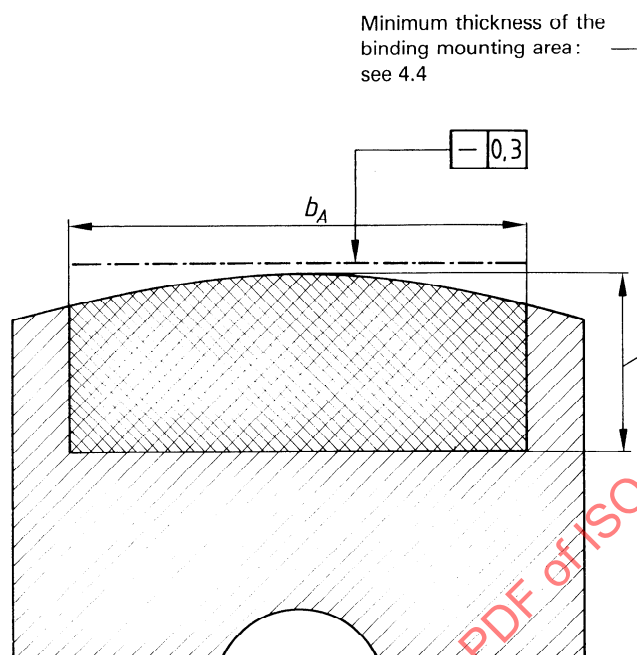


Figure 5 — Convexity

Table 3 — Penetration depth d and minimum screw retention strength $F_{R,min}$

Nominal ski length	Penetration depth	Screw retention strength	Penetration depth	Screw retention strength
	d	$F_{R,min}$	d	$F_{R,min}$
	mm	N	mm	N
Area				
	A_1		A_2 and A_3	
Group 1	$14 \pm 0,5$	1 600	$14 \pm 0,5$	1 200
Group 2	$10 \pm 0,5$	1 300	$10 \pm 0,5$	900

Dimensions in millimetres

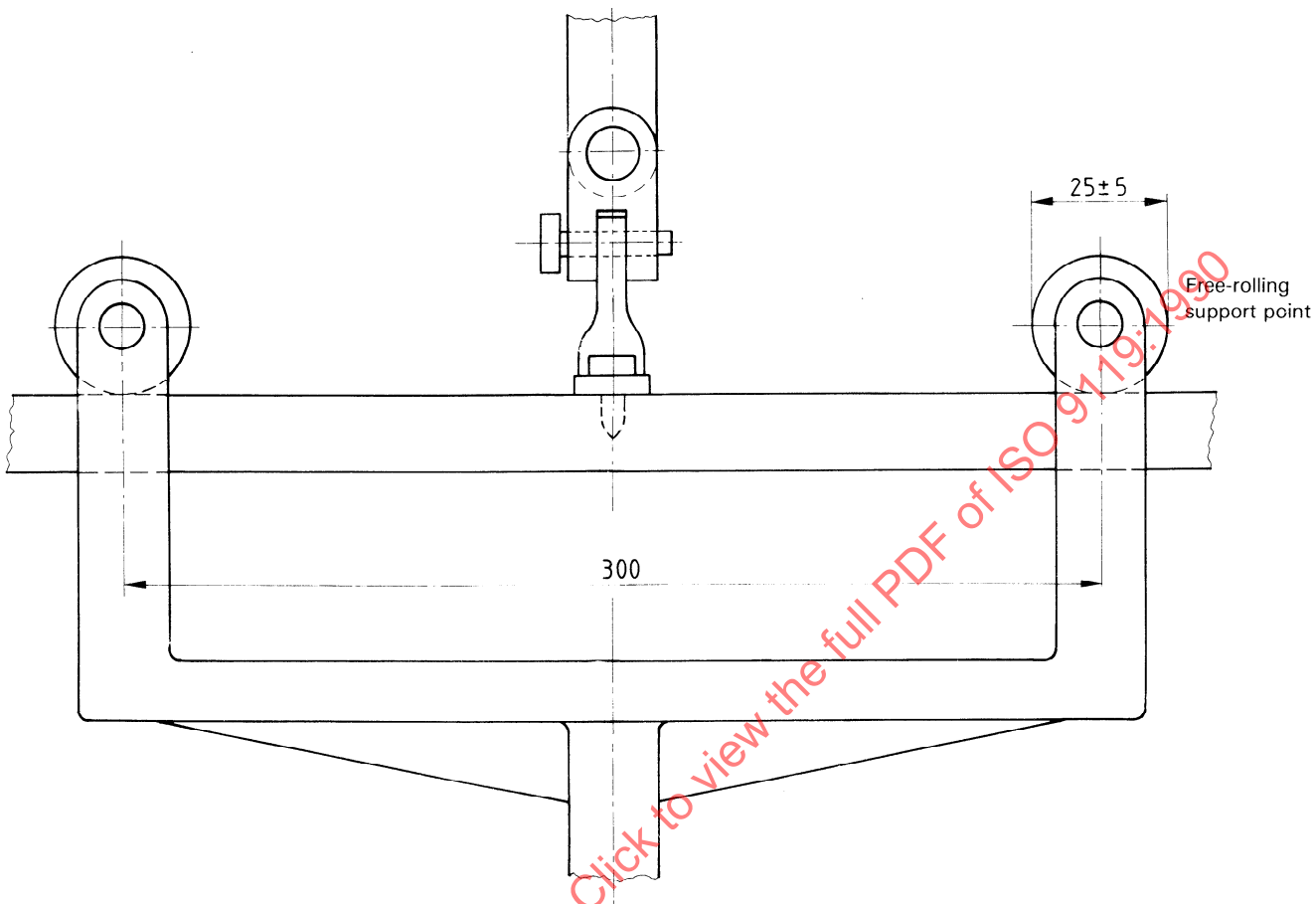


Figure 6 — Test fixture

Dimensions in millimetres

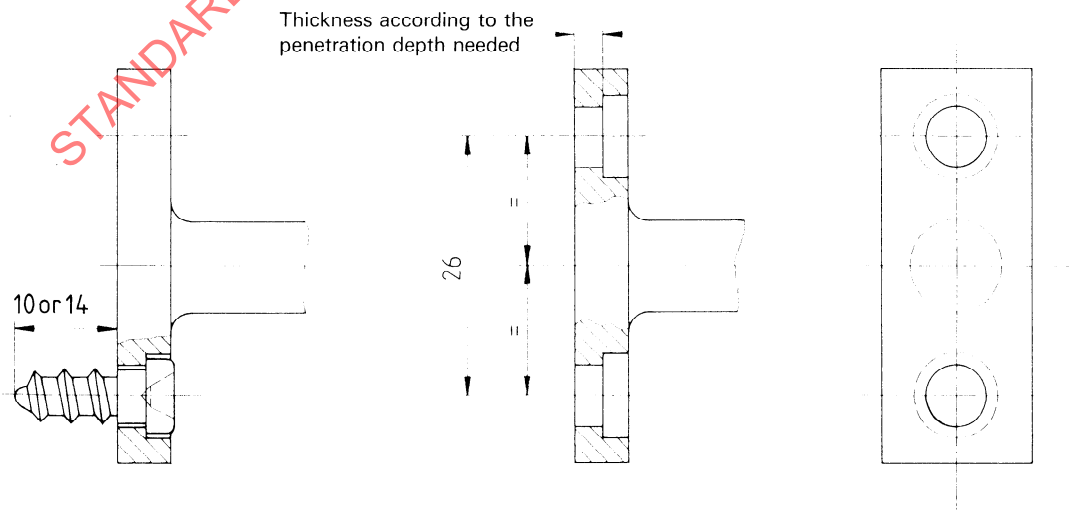
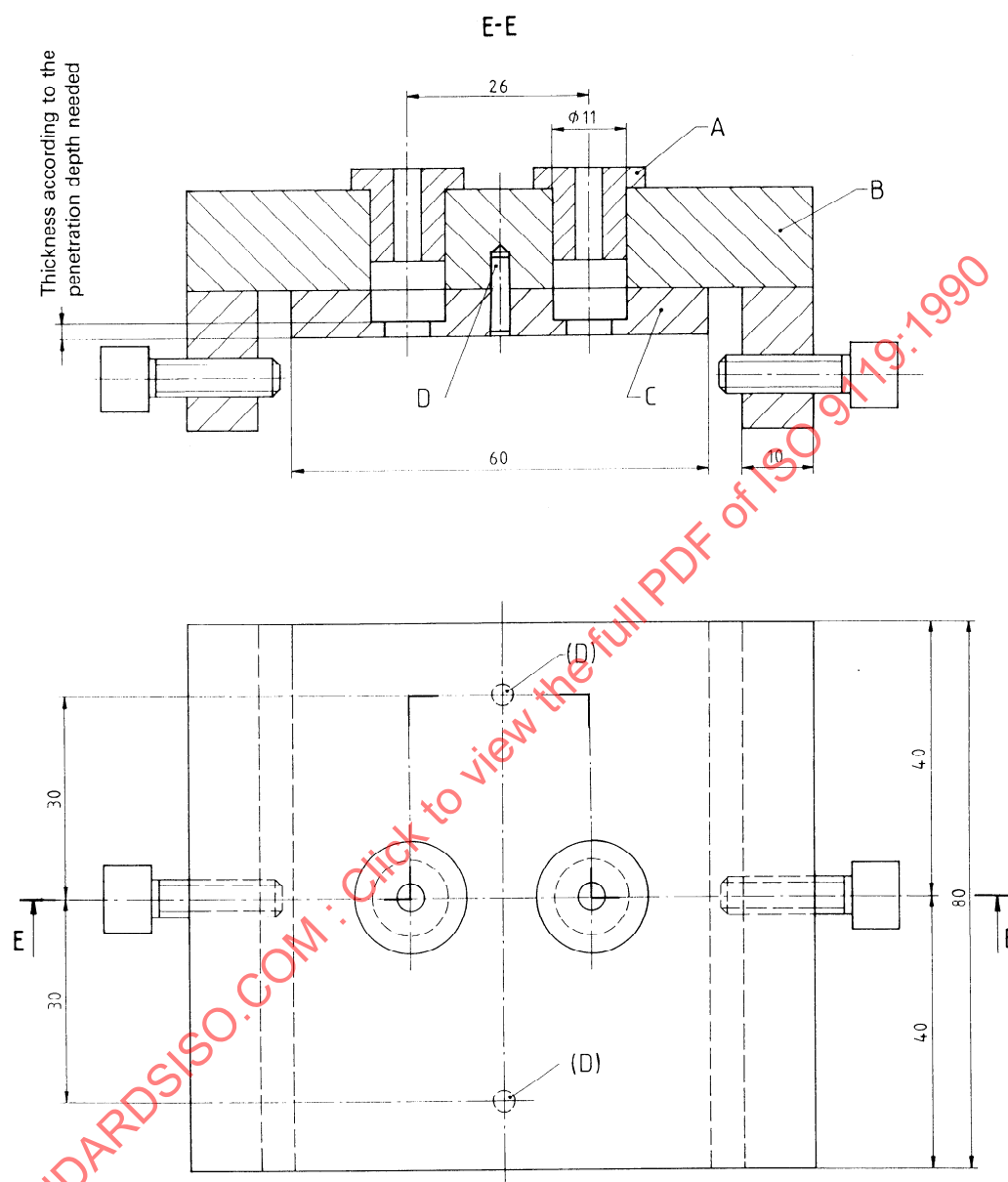


Figure 7 — Attachment element

Dimensions in millimetres

**Legend**

- A = Drill jig bushing
- B = Drill jig
- C = Friction plate
- D = Centering pin to locate the friction plate

Figure 8 — Drill and test jig

Dimensions in millimetres

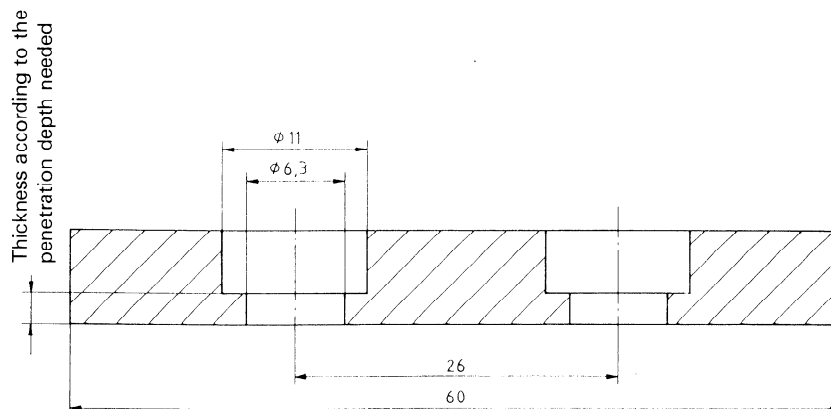


Figure 9 — Friction plate

7 Test screw

7.1 Retention strength

Screws used for attachment of the attachment element described in 6.1.2 and for the static retention strength test shall meet the requirements of ISO 10228.

7.2 Stripping resistance

Test screws with a penetration depth of $10 \text{ mm} \pm 0,5 \text{ mm}$ complying with ISO 10228 shall be used.

8 Procedure

8.1 Sampling and conditioning

At least three pairs of skis shall be tested under standard atmosphere 23/50²⁾, without specific preconditioning.

8.2 Retention strength

8.2.1 Mounting of attachment element

The attachment element shall be attached to the ski by means of two test screws as specified in 7.1.

Accurately locate and drill the holes to the depth indicated in table 4 using a drill jig, as shown in figure 8, ensuring that the drill holes are perpendicular to the surface of the ski.

Table 4 — Hole depths

Dimensions in millimetres

Nominal ski length	Drill hole depth
	Area A_1 , A_2 and A_3
Group 1	15,5 $^{+0,5}_0$
Group 2	11,5 $^{+0,5}_0$

The drill hole diameter shall be 3,6 mm H12 ($^{+0,12}_0$ mm) or according to the recommendations of the ski manufacturer.

Mount the screw perpendicular to the top surface of the ski, without pretapping and without lubrication. The screw tightening torque shall be equal to the measured driving torque increased by 1 N·m. If the so calculated value is less than 3 N·m, increase the tightening torque up to 3 N·m.

8.2.2 Positioning of attachment element within binding mounting areas

The test for the binding mounting area A_1 shall follow the sequence 1, 2, 3, 4 shown in figure 10.

The location of the attachment element within the binding mounting area A_1 is shown in figure 10. Locations 3 and 4 are chosen at random in the longitudinal direction. The minimum spacing for the tests within the area A_1 shall be 25 mm.

The positioning of the attachment element in areas A_2 and A_3 is shown in figure 11.

2) i.e. at $23 \text{ }^\circ\text{C} \pm 5 \text{ }^\circ\text{C}$ and relative humidity of 50 %.