



# SLOVENSKI STANDARD SIST ISO 7331:2013

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**Palice za alpsko smučanje - Zahteve in preskusne metode**

Ski-poles for alpine skiing -- Requirements and test methods

**iTeh STANDARD PREVIEW**  
Bâtons de skis alpins -- Exigences et méthodes d'essai  
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# INTERNATIONAL STANDARD

**ISO  
7331**

Fourth edition  
2011-07-01

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## **Ski-poles for alpine skiing — Requirements and test methods**

*Bâtons de skis alpins — Exigences et méthodes d'essai*

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## 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.

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.

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.

ISO 7331 was prepared by Technical Committee ISO/TC 83, *Sports and recreational equipment*, Subcommittee SC 4, *Snowsports equipment*.

This fourth edition cancels and replaces the third edition (ISO 7331:2005), which has been technically revised.

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# Ski-poles for alpine skiing — Requirements and test methods

## 1 Scope

This International Standard defines the minimum requirements for safety in ski-poles for alpine skiing and specifies test methods to check conformity with these requirements.

It is applicable to ski-poles for alpine skiing in the following ranges of total length,  $l_T$  (see Clause 3):

- group A,  $l_T \geq 1\,050$  mm (adults' poles);
- group B,  $1\,050$  mm  $> l_T \geq 700$  mm (junior poles);
- group C,  $l_T \leq 700$  mm (children's poles).

Special designs may deviate from this International Standard, but shall be marked in a durable manner as special designs (see 9.2).

## 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 554, *Standard atmospheres for conditioning and/or testing — Specifications*

ISO 6508-1, *Metallic materials — Rockwell hardness test — Part 1: Test method (scales A, B, C, D, E, F, G, H, K, N, T)*

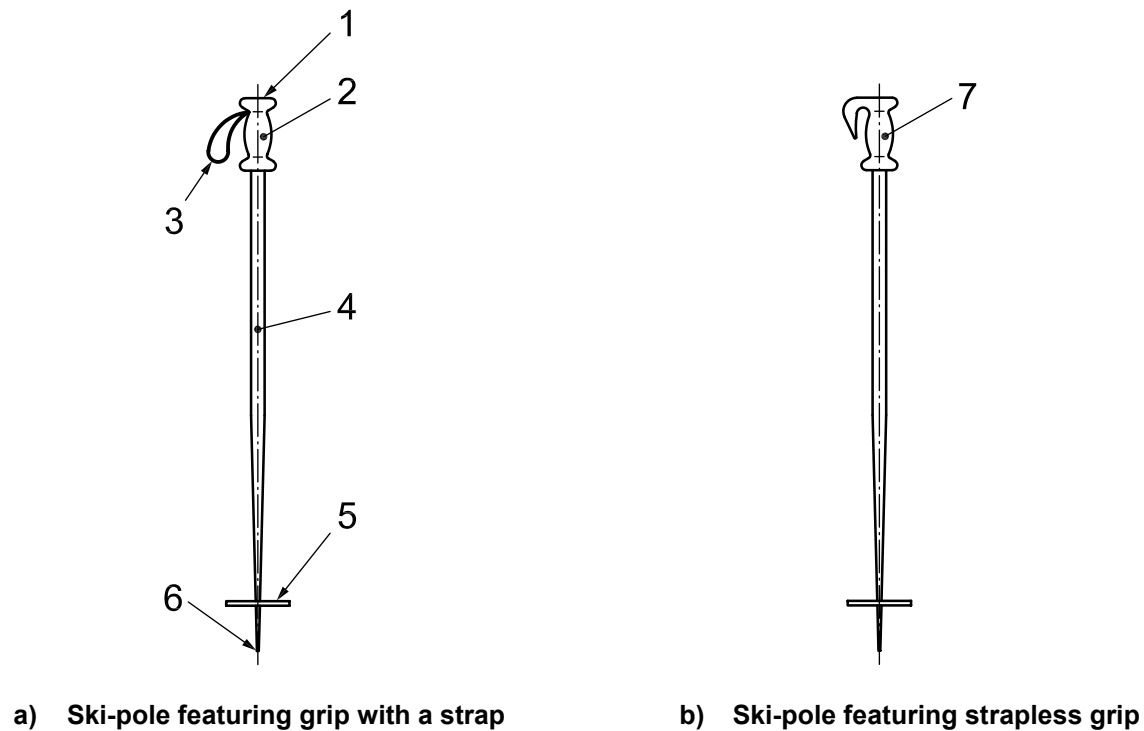
ISO 6508-2, *Metallic materials — Rockwell hardness test — Part 2: Verification and calibration of testing machines (scales A, B, C, D, E, F, G, H, K, N, T)*

ISO 6508-3, *Metallic materials — Rockwell hardness test — Part 3: Calibration of reference blocks (scales A, B, C, D, E, F, G, H, K, N, T)*

## 3 Terms and symbols

### 3.1 Terms

Terms used to designate the different parts of a ski-pole are given in Figure 1.

**Key**

- 1 upper surface of the grip,  $A_G$
- 2 grip
- 3 strap
- 4 shaft
- 5 basket
- 6 tip
- 7 strapless grip

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**Figure 1 — Terms used to designate the parts of a ski-pole**

**3.2 Symbols**

The symbols used in Figures 1 and 2 relate to the following concepts, which shall be expressed in the units given:

- $A_G$  is the upper surface, expressed in square centimetres, of the grip (impact area);
- $-F_Z$  is the compressive force, expressed in newtons, in the axis of the ski-pole;
- $l_T$  is the total length, in millimetres;
- $l_H$  is the length, expressed in millimetres, measured from the tip to the middle of the hand;
- $l_B$  is the length, expressed in millimetres, measured from the tip to the lower surface of the basket;
- $d_B$  is the maximum diameter, expressed in millimetres, of the basket.



## 4 Categories of ski-poles

The length,  $l_H$ , is determined by reference to the width of an average hand:

- group A: 93 mm;
- group B: 73 mm;
- group C: 57 mm.

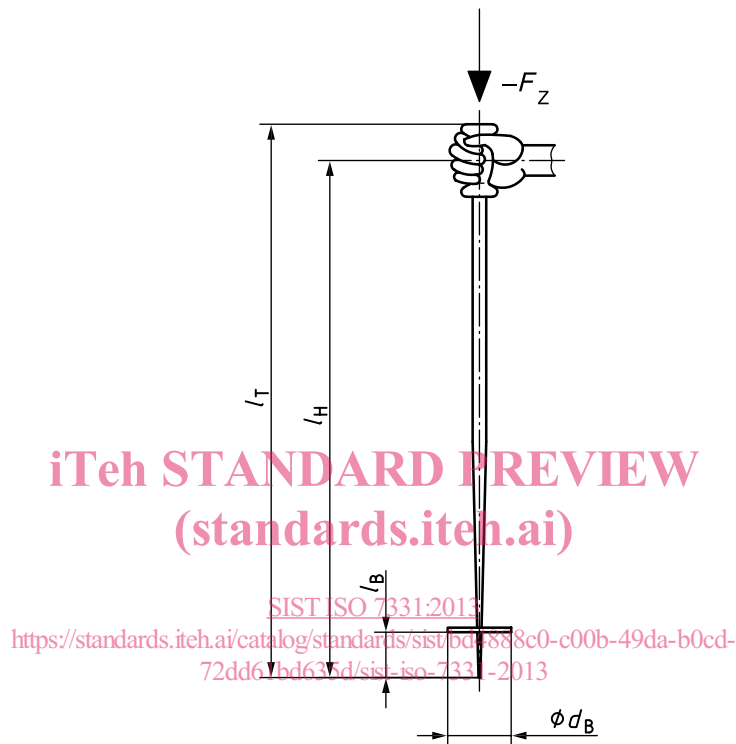


Figure 2 — Centre of rotation and dimensions

## 5 Materials

The materials used shall meet the requirements specified in Clause 8.

## 6 Test conditions

Unless otherwise specified, the test shall be carried out as a type test in the standard atmosphere in accordance with ISO 554 with reduced tolerances.

The reference value for the quasi-static structure of force,  $F$ , with respect to time,  $t$ , expressed in newtons per second (N/s), is given by:

$$\frac{dF}{dt} \leq 100 \text{ N/s}$$

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The test equipment shall be such that all measurable variables such as forces, temperatures, angles, lengths, surfaces, masses and time of oscillation can be measured or determined to the following accuracies:

- Forces, masses:  $\pm 2\%$ ;
- Temperatures:  $\pm 2\text{ }^{\circ}\text{C}$ ;
- Angles:  $\pm 1^{\circ}$ ;
- Lengths of poles:  $\pm 1\text{ mm}$ ;
- Radii and other lengths:  $\pm 0,2\text{ mm}$ .

**7 Test sample**

The three longest and the three shortest poles from each group shall be submitted to the laboratory.

In addition, three poles of 1 200 mm length  $l_T$  from testing group A, and three poles of 1 000 mm length  $l_T$  from testing group B shall be submitted to the laboratory.

One long pole and one short pole shall be selected for the tests to be carried out in accordance with Clause 8.

If one test sample fails these tests, the tests may be repeated with two further test poles, both of which then shall pass the repeated tests.

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**8 Requirements and test methods**

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**8.1 Total length**

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**8.1.1 Requirement**

The total length  $l_T$  shall not vary from the given length by more than  $\pm 10\text{ mm}$ . Furthermore, the lengths of one pair of ski-poles shall not differ by more than 7 mm.

**8.1.2 Testing**

Determine lengths of all test samples indicated in Clause 7.

**8.2 Outward design****8.2.1 Requirement**

Sharp design (except the tip) and rough surfaces, which might cause injury, shall be avoided.

**8.2.2 Testing**

Check visually.

### 8.3 Anti-catching design

#### 8.3.1 Requirement

The ski-pole shall be designed to limit the strain that can be transmitted to the wrist and arm of the skier, should the pole get caught during skiing. This requirement can be met by a design according to 8.6.3 or 8.8.4, or by a strapless grip.

#### 8.3.2 Testing

Test according to 8.6.3 or 8.8.4, or carry out a visual and functional test.

### 8.4 Release mechanism

#### 8.4.1 Function

If so equipped, a release mechanism shall be manufactured so that it functions correctly in environmental conditions encountered during skiing.

#### 8.4.2 Temperature and ice conditions

##### 8.4.2.1 Requirement

If a release mechanism is provided in the shaft, the compressive force in the axis of the pole necessary to cause the release at a temperature of  $-20\text{ }^{\circ}\text{C}$  and in icy conditions, and at a temperature of  $20\text{ }^{\circ}\text{C}$ , shall not vary by more than 30 %.

In addition, the release force at  $-20\text{ }^{\circ}\text{C}$  and in icy conditions shall not exceed the values given in 8.6.3.

##### 8.4.2.2 Testing

Determine the release force at  $20\text{ }^{\circ}\text{C}$  five times per function on one test sample and calculate the mean value.

Store the release mechanism at a temperature of  $-20\text{ }^{\circ}\text{C}$  until this temperature is reached. Determine the release force once and compare it with the mean value at  $20\text{ }^{\circ}\text{C}$ .

Again determine the release force at  $20\text{ }^{\circ}\text{C}$  five times on one test sample and calculate the mean value.

Spray the vertically placed ski-pole with water at  $10\text{ }^{\circ}\text{C}$  or more for 1 min from a distance of 1 m. Store the pole vertically at  $-20\text{ }^{\circ}\text{C}$  until it reaches this temperature, then determine the release force once and compare it with the mean value at  $20\text{ }^{\circ}\text{C}$ .

#### 8.4.3 Fatigue conditions

##### 8.4.3.1 Requirement

The release mechanisms shall be protected against wear so that they still function correctly after 100 releases.

The release forces shall not vary by more than 20 % after the fatigue test.

##### 8.4.3.2 Testing

Carry out 100 releases on each release mechanism; compare the mean value of the first five releases with the mean value of the last five.