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**ISO 13993**

Second edition
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# Rental ski shop practice — Sampling and inspection of complete and incomplete alpine ski-binding-boot systems in rental applications

*Pratique pour la location dans les commerces de matériel de ski — Échantillonnage et contrôle des ensembles complets ou incomplets ski/fixation/chaussure dans les applications de location*

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# Foreword

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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).

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

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This second edition cancels and replaces the first edition (ISO 13993:2001), which has been technically revised.

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The main changes compared to the previous edition are as follows:

a) the range classes are presented in a new Clause 4;

b) a new Clause 5 has been added with summary of practice;

c) the difference between preseason inspection and in-season inspection has been clarified (see Clause 6);

d) a new simplified pre-season inspection has been added for certain combinations of equipment in the inventory where at least one component is unused (see 6.1);

e) sampling requirements have been specified in Clause 7;

f) the test for elastic travel and recentring in A.1.1 has been simplified;

g) a new Annex B has been added for range class I deviations and sample sizes;

h) terms and definitions in Clause 3 have been revised and new terms have been added where appropriate;

i) normative references in Clause 2 have been updated;

j) the text has been editorially revised.

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.

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# Introduction

This document is intended to provide guidelines for performing functional inspections and adjustments of alpine ski-binding-boot systems. Adhering to these guidelines may help to reduce the risk of injuries resulting from improper mechanical functioning of releasable binding systems. However, skiing involves inherent and other risks. Injury can result from simply falling down, impact with an object or from many other actions. Many injuries are unrelated to binding function. Furthermore, even a properly functioning binding cannot release under all injury-producing loads. Therefore, it is clarified that compliance with these guidelines in no way guarantees that injury can be prevented.

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# Rental ski shop practice — Sampling and inspection of complete and incomplete alpine ski-binding-boot systems in rental applications

## 1 Scope

This document specifies a uniform method for the sampling and inspection of complete and incomplete alpine ski-binding-boot systems used in rental operations.

This document is intended for any facility which rents complete and incomplete alpine ski-binding-boot systems as for example when the skier owns the boots.

This document is not applicable for alpine touring ski-binding-boot systems.

This document is not applicable for complete and incomplete alpine ski-binding-boot systems which are rented for 15 days or more.

NOTE 1 A period of less than 15 days is common for equipment being rented.

NOTE 2 ISO 11088 gives a method for testing if the equipment is owned or rented for 15 days or more.

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## 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 5355, *Alpine ski-boots — Requirements and test methods*

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ISO 11088:2018, *Alpine ski/binding/boot (S-B-B) system — Assembly, adjustment and inspection*

ISO 11110, *Winter-sports equipment — Test devices for the setting of the functional unit ski/boot/binding — Requirements and tests*

## 3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

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

— IEC Electropedia: available at https://www.electropedia.org/

— ISO Online browsing platform: available at https://www.iso.org/obp

**3.1**
**system**
<alpine ski> one ski, one boot and one binding, designed to perform a retention and a release function

**3.2**
**complete ski-binding-boot-system**
ski-binding-boot-system where all the components are provided by the rental facility

**3.3**
**incomplete ski-binding-boot system**
ski-binding-boot system where some components (boot or ski/binding) are owned by the customer

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**3.4**
**system binding**
binding that is slid onto a pre-mounted or integrated track without drilling

**3.5**
**pre-mounted binding**
binding that is already mounted on the ski before being delivered to the shop

**3.6**
**interchangeable**
applies to the free exchange of boots within a rental inventory without testing each new combination of system components

**3.7**
**non-interchangeable**
applies to the establishment of specific binding-boot combinations tested each time a new combination is created

**3.8**
**reference binding**
unit that is typical of the bindings in the rental inventory

**3.9**
**reference boot**
boot that is typical of the boots in the rental inventory

Note 1 to entry: For requirements, see A.1.3.

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**3.10**
**manufacturer pre-mounted**
combination of new skis and new bindings provided by the original equipment manufacturer that is ready to be fitted to boots

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**3.11**
**sealed**
protected from damage by the original packaging of the manufacturer during transportation

**3.12**
**indicator setting**
setting displayed on the binding's release adjustment scale

**3.13**
**initial indicator setting**
release indicator setting derived from the binding manufacturer's adjustment chart

Note 1 to entry: The adjustment chart is based on ISO 11088:2018, Table B.1.

**3.14**
**measured release moment**
release value determined by the use of a specified test device

Note 1 to entry: For the purposes of this document, the different types of test devices are defined in Annex A.

**3.15**
**test result**
<ski rental> median quantitative value of three repetitions of the same test

**3.16**
**selected reference moment**
nominal release moment supplied by the binding or test device manufacturer

Note 1 to entry: The range for the nominal release moment is derived from ISO 8061.


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Note 2 to entry: In the case where an algorithm or a table is used to provide reference moments, either value may be used. Any difference in values is usually insignificant.

**3.17**
**accepted inspection tolerance**
maximum difference between the *measured release moment* (3.14) and the selected individual release limited for $M_Z$ and $M_Y$ to the release moments

Note 1 to entry: The theoretical limits for $M_Z$ with ± 15 % or ± 3 Nm (whichever is higher) and $M_Y$ with ± 15 % or ± 10 Nm (whichever is higher) are the base for making Table B.1. The long experience shows that using the table values avoids many errors and is easier to explain to customers.

Note 2 to entry: The release moments are given in ISO 11088:2018, Table B.1, one line above/below of the reference moments.

**3.18**
**correction value**
value added to or subtracted from the initial indicator setting to bring the test result within the *accepted inspection tolerance* (3.17)

**3.19**
**accepted re-adjustment tolerance**
maximum difference between the *measured release moment* (3.14) at the *initial indicator setting* (3.13) and the selected individual release moment, limited for $M_Z$ and $M_Y$ to the release moments

Note 1 to entry: The theoretical limits for $M_Z$ with ± 30 % or ± 6 Nm (whichever is higher) and $M_Y$ with ± 30 % or ± 20 Nm (whichever is higher) are the base for making Table B.1. The long experience shows that using the table values avoids many errors and is easier to explain to customers.

Note 2 to entry: The release moments are given in ISO 11088:2018, Table B.1, one line above/below of the reference moments.

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**3.20**
**lubricated binding test**
release test where the binding-boot-interfaces are lubricated

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Note 1 to entry: Lubrication for example by liquid dish soap.

**3.21**
**troubleshooting**
<ski rental> binding manufacturer's recommendations or procedures for analysing system failure

**3.22**
**corrective action**
procedure other than readjustment of the indicator setting to include repair or replacement of system components

**3.23**
**rental skier day**
number of rental skiers processed through a ski rental facility in a 24 h-period

**3.24**
**random sample**
sample for which each component (preseason) or system (in-season) has an equal chance to be selected

**3.25**
**deviation**
<ski rental> difference between the measured release moment and the selected reference moment, expressed as a percentage of the selected reference moment

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**3.26**
**rental operation**
providing a ski-binding-boot-system to a customer

**3.27**
**seasonal rental**
period of time of 15 days or more for which skiing equipment is rented

**3.28**
**test device**
<ski rental> tool to measure release moments of ski-binding-boot systems and that is according to ISO 11110

**3.29**
**release**
detachment of the boot from the ski by release of the mechanism that ensures the connection between boot and ski

Note 1 to entry: This release is only considered effective when all the loads due to the boot/ski connection have dropped to values which present no danger to the skier.

[SOURCE: ISO 9462:2014, 3.2]

## 4 Range classes

Range class I = accepted re-adjustment tolerance (see 3.19), ISO 11088:2018, Table B.1, two lines above/below of the selected reference moments. Range class I for children bindings with a reference moment $M_Z$ of 20 Nm shall be treated as accepted inspection tolerance (see 3.17).

NOTE Range class I represents the range of acceptable values when a system is evaluated after having been used by the customer.

Range class II = maximum difference between the measured release moment (see 3.14) at the initial indicator setting (see 3.13) and the selected reference moment (see 3.16), limited for $M_Z$ and $M_Y$ to the release moments stated in ISO 11088:2018, Table B.1, three lines above/below of the selected reference moments.

Range class III = maximum difference between the measured release moment (see 3.14) at the initial indicator setting (see 3.13) and the selected reference moment (see 3.16), is more than three lines above/below of the selected reference moments in ISO 11088:2018, Table B.1.

## 5 Summary of practice

**5.1** Figure 1 gives an overview of the rental procedure.

**5.2** Prior to the beginning of each season, boots and bindings shall be inspected for compatibility and interchangeability using a test device.

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