BRITISH STANDARD

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Ice skates — Safety requirements and test methods

ICS 97.220.20

National foreword

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A list of organizations represented on this committee can be obtained on request to its secretary.

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Foreword

This document (EN 15638:2009) has been prepared by Technical Committee CEN/TC 136 “Sports, playground and other recreational facilities and equipment”, the secretariat of which is held by DIN.

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Introduction

When elaborating this document, it was assumed that dimensions cannot be specified for the functional grinding of the blade mentioned in 4.2.7.2, as they depend on the use the ice skates are intended for and differ from user to user.

1 Scope

This standard applies to ice skates intended for users with a body mass up to 100 kg for ice skating excluding the field of sports competitions.

It specifies the minimum safety requirements for ice skates as well as requirements for test methods, marking and information supplied by the manufacturer to reduce the risk of injuries to both third parties and the user during their normal use.

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.

EN 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 6508-1:2005)*

3 Terms and definitions

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

3.1
ice skate
unit (assembly) of boot and runner, intended for ice skating

3.2
runner
part of the ice skate comprised of the blade and a holder

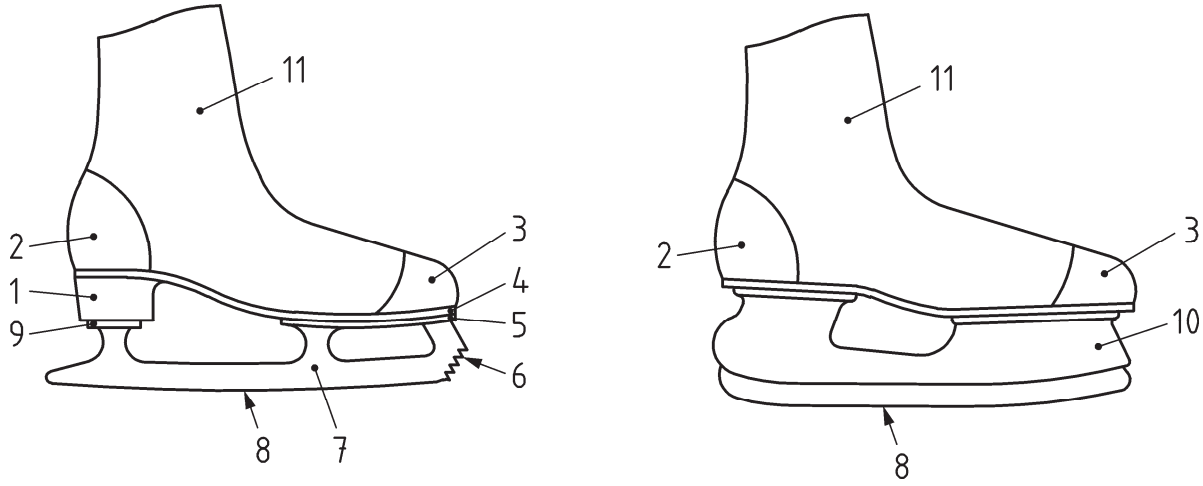
3.3
holder
part of the ice skate for the attachment of the blade

NOTE Holders can be blade holder, sole plate, heel plate or any other suitable holding device.

4 Design

4.1 General

The typical components of an ice skate are shown in Figure 1.



Key

1 Heel
2 Heel cap
3 Toe cap
4 Sole
5 Sole plate
6 Teeth
7 Runner
8 Blade (surface of the runner)
9 Heel plate
10 Blade holder
11 Boot shaft

Figure 1 — Examples of ice skates

NOTE Figure 1 is provided only for representation of the individual components and does not specify any shapes for an ice skate.

4.2 Requirements for design

4.2.1 Connection of the runner to the boot

Binding elements shall prevent unintentional disconnection of the runner from the user's boot.

This requirement is considered to be fulfilled, if the correct functioning of the ice skate is not impeded by broken, disconnected or loosened binding elements after the tests specified in Clause 5.

4.2.2 Attachment of the blade in the blade holder

If blade and blade holder form a unit, it shall be so designed that when tested according Clause 5 the blade neither loosens nor disconnects.

4.2.3 Linearity of the runner

The runner of the ice skate shall not have a deviation from linearity of more than 0,5 mm over a length of 150 mm.

4.2.4 Position of the runner

Any part of the runner shall not protrude over the toe cap of the boot by more than 15 % of the sole length.

4.2.5 Impact resistance

The ice skate shall be designed so as to withstand the impact loads to which it is exposed during normal use. This requirement is considered to be fulfilled if the correct functioning of the ice skate is not impeded by any breaking, disconnection or loosening of the runner after the tests specified in Clause 5.

4.2.6 Surface condition

All protruding components and edges on the ice skate which can come into contact with body parts during normal use shall be deburred or shall be designed so as to prevent any injuries.

Protruding fastening elements shall not stand out by more than the diameter of the fastening element.

4.2.7 Condition of the blade

4.2.7.1 Hardness

The blade shall have an effective hardening depth of at least 2,5 mm. The hardness value shall be at least 52 HRC on all hardening depth.

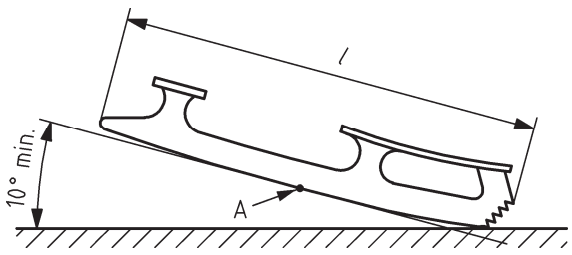
These requirements do not apply, if the blade is not intended for regrinding.

4.2.7.2 Grinding (sharpening)

The blade shall be grinded so as to be functional. The necessity to regrind or replace the blade shall be indicated in the information supplied by the manufacturer.

4.2.7.3 Teeth

If a blade is equipped with teeth, the bottom teeth shall only come into contact with the ice, when the ice skate has an inclination of at least 10° towards the front, measured at the tangent of the runner at point A. See Figure 2.



Key
A ½ *l*

Figure 2 — Ice contact of the bottom tooth

4.2.7.4 Shape of blade end

The end of the blade shall either be rounded or shaped in such a manner that there is no angle smaller than 90°.

4.2.7.5 Thickness

The blade shall have a thickness of at least 2,8 mm.

5 Testing

5.1 General

Any requirements in this standard, for which no test method has been specified in Clause 5, shall be checked by measurement or by visual or tactile examination.

Unless otherwise specified, the ice skates shall be conditioned and tested either at a temperature of (23 ± 2) °C and a relative humidity of (50 ± 5) % or at a temperature of (20 ± 2) °C and a relative humidity of (65 ± 5) %.

5.2 Test specimen

A new test specimen shall be used for each test in accordance with 5.4 and 5.5.

5.3 Last

The last used for the tests in accordance with 5.4 and 5.5 shall fulfil the following requirements:

a) it shall be made of non-flexible material;

b) its size and fit shall be appropriate for the test specimen;

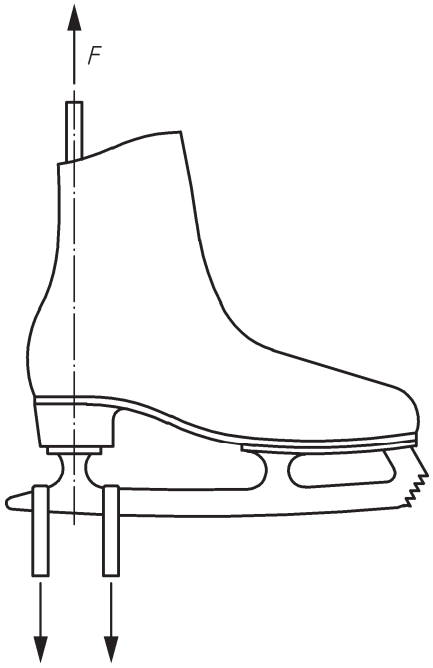
c) it shall be possible to firmly attach the ice skate to the last by use of the binding elements of the skate.

5.4 Connection of the runner to the boot

The ice skate is mounted in a universal test machine as shown in Figure 3, with the force being applied into the boot by a last as defined in 5.3.

The ice skate shall be positioned on a last in accordance with 5.3. It shall be tightened as close as is practical.

A quasi-static tensile force is applied at a speed of (100 ± 10) mm/min up to a tensile force F of 2 000 N.



Key
F tensile force

Figure 3 — Testing of the attachment of runner to shoe

5.5 Resistance against impact loads

5.5.1 Conditioning

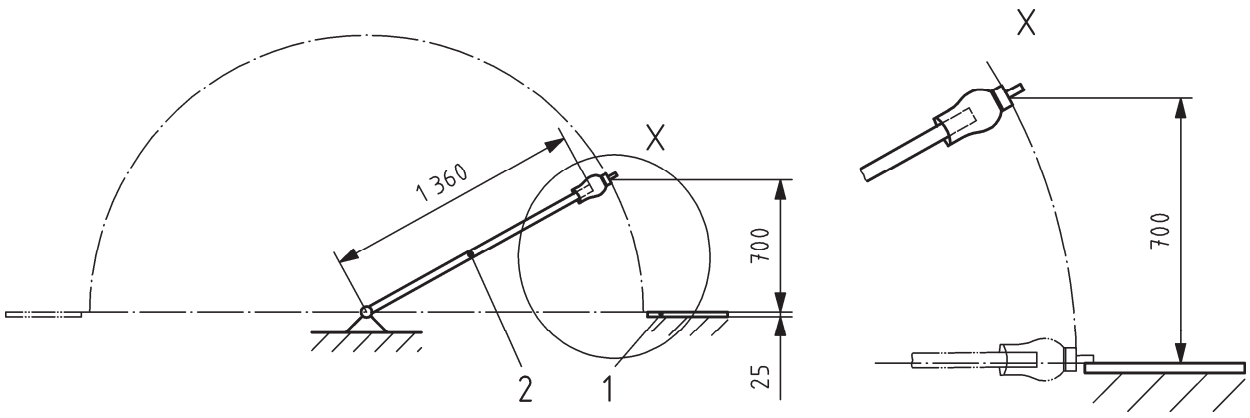
The resistance test shall be carried out after the ice skate has been conditioned for at least 6 h at a temperature of (- 20 ± 1) °C. Testing shall start within 1 min after the ice skate has been removed from the conditioning environment and shall be concluded within 5 min.

5.5.2 Lateral impact onto the blade

The ice skate shall be impacted laterally with the entire runner and with an energy of (25 ± 2) J and an impact velocity of (2,5 ± 0,3) m/s onto a rubber plate of a hardness of (75 ± 2) Shore A and an absorbing surface of 300 mm × 50 mm, see for example Figure 4. The energy may be impacted either by pendulum, falling mass or falling ice skate.

EXAMPLE

Dimensions in millimetres



Key
1 Rubber plate
2 Round steel of 25 mm diameter

Figure 4 — Lateral impact

The type of suspension shall ensure that the energy is absorbed by the blade. The ice skate shall be positioned on a last in accordance with 5.3. It shall be tightened as close as is practical.

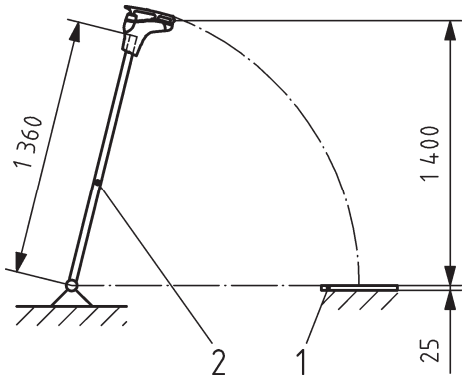
The test specimen shall then be turned by (90 ± 1)°.

5.5.3 Frontal impact onto the blade tip and end

The ice skate shall be impacted in the forward direction three times onto the front tip of the blade and three times onto the blade end with an energy of (50 ± 2) J and an impact velocity of (4,0 ± 0,4) m/s against a rubber plate of a hardness of (75 ± 2) Shore A and an absorbing surface of 300 mm × 50 mm, see for example Figure 5. The energy may be impacted either by pendulum, falling mass or falling ice skate.

EXAMPLE

Dimensions in millimetres



Key
1 Rubber plate
2 Round steel of 25 mm diameter

Figure 5 — Frontal impact

The type of suspension shall ensure that the energy is absorbed by the blade. The ice skate shall be positioned on a last in accordance with 5.3. It shall be tightened as close as is practical.

5.6 Hardness of the runner

Testing shall be carried out in accordance with EN ISO 6508-1.

6 Marking

Each ice skate shall be legibly and durably marked with the following information:

a) the number of this standard;

b) the name, trademark or other means of identification of the manufacturer or retailer;

c) means of identification of the model;

d) the boot size;

e) information on material identification of the boot.

7 Information supplied by the manufacturer

7.1 General

Easily understood information supplied by the manufacturer shall be provided with each pair of ice skates. This shall ensure that even a novice user will be able to use, handle and maintain the ice skates. Texts describing difficult or complicated operations are to be complemented with illustrations.

The manufacturer's information shall be supplied together with the recommendation that this information shall be retained by the user for future reference.

7.2 Contents

7.2.1 General

The information supplied by the manufacturer shall contain, in text or picture form, at least the information specified in 7.2.2, 7.2.3 and 7.2.4.

7.2.2 Information about the construction of the ice skate

This information shall contain at least:

a) advice that no modifications shall be made that can impair safety;

b) advice indicating when self-locking nuts and other self-locking fixings may loose their effectiveness.

7.2.3 Instructions for use

The instructions for use shall contain at least:

a) description of the correct techniques for use and for braking;

b) advice that the user should always wear protective equipment;

c) instruction to check before each use that the connective components of the ice skate are firmly secured;

d) advice indicating any practical use (e.g. figure skating, ice hockey, normal skating);

e) advice concerning the elimination of any anticipated incorrect use of an ice skate;

f) instruction to use blade protectors outside the ice surface.

7.2.4 Servicing and maintenance instructions

Service and maintenance instructions shall state that regular maintenance enhances the safety of the equipment and shall include:

a) advice regarding the various properties of the ice skate and its maintenance;

b) advice concerning the replacement/exchange of individual parts;

c) note regarding the necessity of regrinding;

d) advice for running checks.

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