SLOVENSKI STANDARD

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Varovalna obleka za uporabo pri deskanju na snegu - Ščitniki zapestja - Zahteve in preskusne metode (ISO/DIS 20320:2018)

Protective clothing for use in Snowboarding - Wrist Protectors - Requirements and test methods (ISO/DIS 20320:2018)

Schutzkleidung zum Gebrauch beim Snowboard-Fahren - Handgelenkschützer - Anforderungen und Prüfverfahren (ISO/DIS 20320:2018)

Habillement de protection destinés à la pratique du surf des neiges - Dispositifs de protection des poignets - Exigences et méthodes d’essai (ISO/DIS 20320:2018)

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Protective clothing for use in Snowboarding — Wrist Protectors — Requirements and test methods

Vêtements de protection destinés à la pratique du surf des neiges - Dispositifs de protection des poignets - Exigences et méthodes d'essai

ICS: 13.340.40; 97.220.20

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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.

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.

ISO 20320 was prepared by Technical Committee ISO/TC 94, Personal safety — Protective clothing and equipment, Subcommittee SC 13, Protective clothing and by Technical Committee CEN/TC 162, Protective clothing including hand and arm protection and lifejackets, in collaboration.

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.

Introduction

Snowboarding are all the pastimes and competitions in which a snowboard is used. The users range from small children to adults of all ages.

The wrist is the most frequently injured body region among snowboarders. The majority of wrist injuries are consequences of falls. The most common injury mechanism is described as a compressive load applied to a hyperextended wrist. Beginners and children have a high incidence of wrist injuries due to snowboarding. One third of injuries among beginner snowboarders are to the wrist.

Studies have shown that the risk of sustaining a wrist injury can be reduced by wearing wrist protection. Wrist protectors in snowboarding are intended to protect the wearer against fractures as well as contusions and sprains.

Wrist protectors will not prevent all wrist, forearm, hand, elbow and shoulder injuries in snowboard accidents.

A wide variety of wrist protectors is commercially available. Consumers can choose between different principal design concepts. One is the “integrated protection concept” in which the protective elements are integrated within a glove. Another one is the “separated protection concept” where the protective elements are individual components (similar to a brace or orthosis) that can be worn with or without a glove. If worn with a glove it can be foreseen to place them underneath or on top of the glove [1],[2],[3],[4].

Protective clothing for use in Snowboarding — Wrist Protectors — Requirements and test methods

1 This document specifies the requirements and test methods for ergonomics, innocuousness, comfort/sizing, restraint, ability to limit wrist extension and attenuate impact force on the palm as well as provisions for marking and instructions supplied by the manufacturer for wrist protectors for all users of snowboard equipment. It does not apply to protectors used in roller sports, alpine skiing, or other sports. This standard does not address protection for the forearm due to axial forces caused by an impact on the fingers or fist. Moreover, this standard does not address protection against palmar flexion (terminal flexion) caused by an impact on the dorsal side of the hand.

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 21420, *Protective gloves — General requirements and test methods*

EN 1082-1, *Protective clothing — Gloves and arm guards protecting against cuts and stabs by hand knives -Part 1: Chain mail gloves and arm guards*

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:

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

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

3.1
wrist
radio-carpal joint

3.2
dorsal
pertaining to upper side or back of the hand and wrist

3.3
palmar
pertaining to the lower side or bottom of the hand and wrist

3.4
wrist protector (wrist guard)
device worn on the wrist and extending onto the forearm and the hand, that is intended to reduce the risk of wrist injuries by mechanical impact

3.5
concepts of wrist protectors
3.5.1
integrated protection concept
glove and protection elements form one unit and have to be used as one product

3.5.2
standalone protection concept
protection elements form a wrist protector whereas the protector can be worn without or with glove. If wearing a glove is foreseen by the manufacturer suitable gloves shall be specified

Note 1 to entry: The manufacturer specifies if the protector is to be worn with or without a glove. If a glove is part of the protection concept, the manufacturer specifies how the protector is to be worn, for example, whether the protector is to be worn underneath or on top of the glove.

3.7
stiffness element
design element that limits wrist extension

3.8
splint
type of stiffness element that uses semi-rigid support on either the dorsal and/or palmar area of the protector or glove

3.9
fastener
strap or connector attaching wrist protector to the wrist

4 Requirements

4.1 General

Performance requirements shall be based on 3 ranges (A, B, C) as defined in Table 1.

Table 1 — Correlation Range to Size

	Range		
	A	B	C
size[1)]	≤ 6	7 – 8	≥ 9

1) The size of the wrist protector shall be defined according to the hand size in ISO 21420.

4.2 Splints

Wrist protectors may have splints. If splints are used, their dimensions must be appropriate. The dimension shall conform to the measures as given in Table 2. The reference point for measurements shall be the plane of the wrist of an appropriate size of assessor (see Table 1), who has put on the protector in straight position. The position of the plane of the wrist of the assessor shall be determined according to EN 1082-1.

Table 2 — Minimum dimensions of splints in wrist protectors (Values in mm)

Location of stiffness elements	Range		
	A	B	C
Length from the wrist up the arm	45 ± 2	50 ± 2	55 ± 2
Length from the wrist towards the finger tip	40 ± 2	45 ± 2	50 ± 2
Total width at each end of the stiffness elements	25 ± 2	25 ± 2	30 ± 2
Note Basic difference of A, B and C are based on [7].			

4.3 Ergonomics

When tested in accordance with 5.4 and 5.5, the assessor shall be able to carry out all the defined movements without any discomfort, significant problem or hazard being encountered.

To obtain a positive result, each of the questions needs to be answered with "yes".

4.4 Innocuousness

Manufacturers of products complying with this standard shall consider the health and protection of the user, the environment and the supply chain.

The information supplied by the manufacturer should list the substances used for the main components of the product.

Protectors shall be examined visually for the absence of any sharp edges and/or other design features that may cause problems.

4.5 Restraint

Wrist protectors shall be easily fitted by the user. They shall fit firmly to the hand of the intended size (see Table 1), shall not release from the hand during use, and shall remain in the location they are designated to protect during all typical movements. When tested in accordance with 5.5.4, the displacement (see Figure 2: $l_2 - l_1$) of each test shall not exceed 20 mm. When using splints as stiffening elements, they shall remain in position during the tests.

4.6 Impact protection of the palm.

Wrist protectors can have protection elements that protect the palm against impact.

A protector complies with this standard if the mean value of the peak force does not exceed the values in Table 3 when tested in accordance with 5.7.

Table 3 — Impact performance requirements for protection of the palm

Range			Maximum peak force [kN]
A	B	C	
e [J]	e [J]	e [J]	
3 ± 0.2	4 ± 0.2	5 ± 0.2	3
e impact energy			

4.7 Limitation of wrist extension

Wrist protectors shall be sufficiently stiff that when loaded with Torque 1 according to Table 7 the resulting Extension 1 of the artificial wrist joint shall be within 60° to 80°. When loaded with Torque 2 according to Table 7, the resulting Extension 2 of the artificial wrist joint shall be within 65° to 85°.

When Torque 2 according to Table 7 is applied, Extension 2 shall be at least 5° greater than Extension 1.