



SLOVENSKI STANDARD
oSIST prEN ISO 18527-1:2018
01-julij-2018

Ščitniki za oči in obraz za uporabo pri športu - 1. del: Zahteve za smučarska očala za smuk in deskanje na snegu (ISO/DIS 18527-1:2018)

Eye and face protectors for sports use - Part 1 - Requirements for downhill skiing and snow-boarding goggles (ISO/DIS 18527-1:2018)

Augen- und Gesichtsschutz für sportliche Anwendungen - Teil 1: Anforderungen an Abfahrtski- und Snowboardbrillen (ISO/DIS 18527-1:2018)

Protection des yeux et du visage à usage sportif - Partie 1: Exigences relatives aux lunettes de ski alpin et de surf des neiges (ISO/DIS 18527-1:2018)

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Ta slovenski standard je istoveten z: prEN ISO 18527-1

ICS:

13.340.20	Varovalna oprema za glavo	Head protective equipment
97.220.20	Oprema za zimske športe	Winter sports equipment

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DRAFT INTERNATIONAL STANDARD

ISO/DIS 18527-1

ISO/TC 94/SC 6

Secretariat: BSI

Voting begins on:
2018-05-23Voting terminates on:
2018-08-15

Eye and face protection for sports use —

Part 1: Requirements for downhill skiing and snow-boarding goggles

*Protection des yeux et du visage à usage sportif —**Partie 1: Exigences relatives aux lunettes de ski alpin et de surf des neiges*

ICS: 97.220.20; 13.340.20

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ISO/CEN PARALLEL PROCESSING



Reference number
ISO/DIS 18527-1:2018(E)

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Published in Switzerland

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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).

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For an explanation on 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 the following URL: www.iso.org/iso/foreword.html.

The committee responsible for this document is ISO/TC 94, *Personal safety - Protective clothing and equipment*, Subcommittee SC 6, *Eye and face protection*.

A list of the parts of ISO 18527 can be found on the ISO website.

ISO/DIS 18527-1:2018(E)**Introduction**

This family of documents was developed in response to the worldwide stakeholder's demand for minimum requirements and test methods for eye and face protectors traded internationally. ISO 4007 gives the terms and definitions for all the various product types. The test methods are in the ISO 18526-series, while the requirements for occupational eye and face protectors are in the ISO 16321-series. Eye protection for specific sports is mostly dealt with by the ISO 18527-series. A guidance document for the selection, use and maintenance of eye and face protectors is in preparation.

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Eye and face protection for sports use —

Part 1:

Requirements for downhill skiing and snow-boarding goggles

1 Scope

This document applies to all afocal (plano power) goggles, intended for eye protection against hazards including ultraviolet and visible solar radiation, rain, snow and wind, during downhill skiing, snowboarding and other similar activities. It deals with materials, construction, optical properties and testing.

Requirements for the labelling and marking of goggles and for information to be supplied by the manufacturer are also specified. Information on the Selection and use of downhill skiing and snowboarding goggles is given in [Annex A](#).

This document does not apply to:

- a) eye protectors for protection when operating or travelling on a motorized vehicle;
- b) eye protectors for protection against artificial optical radiation, such as those used in solarium;
- c) eye protectors for direct observation of the sun;
- d) eye protectors intended for sports with unrelated hazards and risks.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 4007:2018, *Personal protective equipment – Eye and face protection – Vocabulary*

ISO 8980-4:2006, *Ophthalmic optics — Uncut finished spectacle lenses — Part 4: Specifications and test methods for anti-reflective coatings*

ISO 8980-5:2005, *Ophthalmic optics — Uncut finished spectacle lenses — Part 5: Minimum requirements for spectacle lens surfaces claimed to be abrasion-resistant*

ISO 11664-2, *Colorimetry — Part 2: CIE standard illuminants*

ISO 18526-1,¹⁾ *Eye and face protection – Test methods – Part 1: Geometrical optical properties*

ISO 18526-2,²⁾ *Eye and face protection – Test methods – Part 2: Physical optical properties*

ISO 18526-3,³⁾ *Eye and face protection – Test methods – Part 3: Physical and mechanical properties*

1) Under preparation (Stage at the time of publication ISO/DIS 18526-1)

2) Under preparation (Stage at the time of publication ISO/DIS 18526-2)

3) Under preparation (Stage at the time of publication ISO/DIS 18526-3)

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ISO 18526-4,⁴⁾ *Eye and face protection – Test methods – Part 4: Headforms*

3 Terms and definitions

For the purposes of this document, the terms and the definitions given in ISO 4007 and the following apply.

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

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

For the purposes of this document, “goggle” or “goggles” shall be taken to mean goggles for downhill skiing, snowboarding and other similar activities.

4 General requirements for goggles

4.1 Headforms

Unless the manufacturer defines the applicable headforms according to ISO 18526-4 to be compatible with the goggle, the test methods where headforms are required shall use the headform 1-M according to ISO 18526-4 as the default.

4.2 Construction

Areas of the goggles that may, during intended use, come into contact with the wearer shall be smooth, without sharp protuberances that may cause discomfort or injury to the wearer. This shall be tested by physical inspection in accordance with ISO 18526-3:6.1.

4.3 Lens material and surface quality

In a circular area 30 mm diameter centred on the reference point but excluding a marginal area 5 mm wide around the edge of the lens if this overlaps with the circular area, filters shall have no material or machining defects that may impair vision, e.g., bubbles, scratches, inclusions, dull spots, pitting, mould marks, notches, reinforced areas, specks, beads, water specks, pocking, gas inclusions, splintering, cracks, polishing defects or undulations. Outside this zone, small isolated material and/or surface defects may be acceptable. This shall be tested by visual assessment in accordance with ISO 18526-3, 6.6.

4.4 Physiological compatibility

Goggles shall be designed and manufactured in such a way that, when used under the conditions and for the purposes intended, they will not compromise the health or safety of the wearer. The risks posed by substances leaking or evaporating from the goggle that can come into prolonged contact with the wearer, shall be reduced by the manufacturer to within the limits of any existing regulatory requirement. Special attention shall be given to substances that are allergenic, carcinogenic, mutagenic or toxic to reproduction.

NOTE 1 Excessive pressure due to a poor fit on the face, chemical irritation or allergy is known to produce reactions. Rare or idiosyncratic reactions to any material are known to occur and the individual wearer is well advised to avoid those types of frame materials.

NOTE 2 Specific national regulations with regard to restriction of certain chemical substances should be observed, for example release of nickel in Europe.

4) Under preparation (Stage at the time of publication ISO/DIS 18526-4)

4.5 Retention by headband and harnesses (sit and fit)

Goggles shall sit in the intended position during normal use and shall adapt to the contours of the face.. The head strap shall be designed to be flexible or adjustable and sit securely on the back of the head or a helmet. The head strap assembly shall not cause any discomfort nor exhibit any insecurity when tested in accordance with ISO 18526-3, 6.5.

5 Transmittance

5.1 Test methods

Transmittance values shall be determined in accordance with ISO 18526-2:, [Clauses 6 to 11](#) as appropriate. Luminous transmittance shall be calculated using CIE standard illuminant D65 (ISO 4007:2018, term 3.9.1.32).

5.2 Transmittance categories

Depending upon their luminous transmittance at their reference point and at $(+5 \pm 2)$ °C in the case of lenses with temperature sensitive transmittance, lenses for downhill skiing and snowboarding use shall be attributed to one of the five tint categories in [Table 1](#).

The range of the luminous transmittance of these five categories is given by the values in [Table 1](#). There are only three descriptive groups for use by consumers as shown in [Table 8](#). An overlap of the transmittance values shall be not more than ± 2 % (absolute) between the categories 0, 1, 2 and 3. There is no overlap in transmittance values between categories 3 and 4.

If the supplier declares a luminous transmittance value, the maximum deviation for this value shall be ± 3 % absolute for the transmittance values falling in categories 0 to 3 and ± 30 % relative to the stated value for the transmittance values falling in tint category 4.

When describing the transmittance properties of a lens with changeable tint, e.g. photochromic, two categories for transmittance values are generally used. These two values correspond to the highest and lowest transmittance states of the lens.

In the case of a gradient-tinted lens the transmittance value at the reference point shall be used to characterize the luminous transmittance and the tint category.

For a gradient-tinted lens, the overlap in luminous transmittance allowed between categories shall be double that for uniformly tinted lenses.

[Table 1](#) also specifies also the UV requirements for these lenses. If the lenses are claimed by the manufacturer to protect against IR radiation, the IR requirements in [Table 1](#) apply.

Table 1 — Transmittance requirements for downhill skiing and snowboarding lenses

Tint category	Wavelength range from 280 nm to 400 nm			Visible spectral range	Optional infrared spectral range
	Maximum solar UV-B transmittance τ_{SUVB} 280 nm $\leq \lambda \leq$ 315 nm	Maximum solar UV-A transmittance τ_{SUVA} 315 nm $\leq \lambda \leq$ 380 nm	Mean 380 to 400 nm spectral transmittance $\tau_{\text{380-400}}$ 380 nm $\leq \lambda \leq$ 400 nm	Luminous transmittance τ_{VD65} 380 nm $\leq \lambda \leq$ 780 nm	Maximum transmittance τ_{SIR} 780 nm $\leq \lambda \leq$ 2000 nm
S0	0,05 τ_{VD65}	0,30 τ_{VD65}	0,75 τ_{VD65}	$\tau_{\text{VD65}} > 80 \%$	τ_{VD65}
S1	0,05 τ_{VD65}	0,30 τ_{VD65}	0,75 τ_{VD65}	$43 \% < \tau_{\text{VD65}} \leq 80 \%$	τ_{VD65}
S2	1,0 % absolute or 0,05 τ_{VD65} whichever is greater	0,25 τ_{VD65}	0,5 τ_{VD65}	$18 \% < \tau_{\text{VD65}} \leq 43 \%$	τ_{VD65}
S3	1,0% absolute	0,15 τ_{VD65}	0,5 τ_{VD65}	$8 \% < \tau_{\text{VD65}} \leq 18 \%$	τ_{VD65}
S4	1,0% absolute	0,15 τ_{VD65}	0,5 % absolute or 0,125 τ_{VD65} whichever is greater	$3 \% < \tau_{\text{VD65}} \leq 8 \%$	τ_{VD65}

NOTE Some national requirements may stipulate a different requirement for the long wavelength limit of UV-A.

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5.3 General transmittance requirements

5.3.1 Uniformity of luminous transmittance and transmittance matching

5.3.1.1 Uniformly tinted lenses

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Lenses that are intended to be uniformly tinted shall appear to be visually uniform within a circle 30 mm in diameter around the reference points or to the edge of the lens less the marginal zone 5 mm wide, whichever is greater, and appear to have the same transmittance at the two reference points when inspected against a white background in accordance with ISO 18526-3, 6.6. Where there is visible non-uniformity, then, when tested according to ISO 18526-2, 7.4, the relative difference in the luminous transmittance value between any two points of the lens shall not be greater than 15 % (relative to the higher value), except for tint category S4 where it shall not be greater than 20 %.

Where there are visibly mismatched transmittances at the reference points, when measured in accordance with ISO 18526-2, 7.5, the difference in luminous transmittance values at the reference points for the right and left eyes shall not exceed 15 % (relative to the higher transmittance).

5.3.1.2 Linear gradient-tinted lenses

In the case of mounted linear gradient-tinted lenses, when inspected against a white background in accordance with ISO 18526-3:—, 6.6, the luminous transmittances shall appear constant in the horizontal direction and having equal transmittance at the reference points. Where there is visible rotation of the gradient or visibly mismatched transmittances at the reference points, when measured in accordance with ISO 18526-2, 7.5 the difference in the luminous transmittances between pairs of points of the lens at the reference points and 15 mm to the left, to the right, above and below the reference point shall not exceed 15 % (relative to the higher value).

5.3.1.3 Radial gradient-tinted lenses

When measured in accordance with ISO 18526-2, 7.5, the difference in the luminous transmittances between pairs of points of the lens at the reference points and 15 mm to the left, to the right, above and below the reference point shall not exceed 15 % (relative to the higher value),