DRAFT INTERNATIONAL STANDARD ISO/DIS 12312-1



ISO/TC 94/SC 6

Secretariat: BSI

Voting begins on: 2009-10-15

Voting terminates on: 2010-03-15

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • MEXCHAPODHAR OPPAHU3ALUR TO CTAHDAPTU3ALUR • ORGANISATION INTERNATIONALE DE NORMALISATION

Eye and face protection — Sunglasses and related eyewear — Part 1: Sunglasses for general use

Lunettes de soleil pour usage général — Lunettes de soleil et articles de lunetterie associés —

Partie 1: Lunettes de soleil pour usage général

ICS 13.340.20

This draft has been developed within the International Organization for Standardization (ISO), and processed under the **ISO-lead** mode of collaboration as defined in the Vienna Agreement.

This draft is hereby submitted to the ISO member bodies and to the CEN member bodies for a parallel five-month enquiry.

Should this draft be accepted, a final draft, established on the basis of comments received, will be submitted to a parallel two-month approval vote in ISO and formal vote in CEN.

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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.

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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.

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ISO 12312-1 was prepared by Technical Committee ISO/TC 94, Personal safety - Protective clothing and I chose standard in the standard in the standard in the second and a standard in the second and a standard in the standard in equipment, Subcommittee SC 6, Eye and face protection.

ISO 12312 consists of the following parts, under the general title Sunglasses and related eyewear.

Part 1: Sunglasses for general use

Eye and face protection — Sunglasses and related eyewear — Part 1: Sunglasses for general use

1 Scope

This standard applies to all afocal (plano power) sunglasses and clip-ons for general use intended for protection against solar radiation.

Information on the use of sunglare filters is given in annex A. Requirements for unmounted oculars used as replacement or alternative filters are given in annex B.

This standard does not apply to:

- a) eyewear for protection against radiation from artificial light sources, such as those used in solaria;
- b) eye protectors specifically intended for sports, for which separate standards are available (e.g. ski goggles or other types);
- c) sunglasses that have been medically prescribed for attenuating solar radiation;
- d) products intended for direct observation of the sun, such as for solar-eclipse viewing.

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 12311: 200x, Personal protective equipment — Eye and face protection – Test methods for sunglasses and related equipment¹)

ISO 4007, Eye and face protection - Vocabulary

ISO/TS 24348:2003, Ophthalmic optics - Spectacle frames - Method for the simulation of wear and detection of nickel release from coated metal and combination spectacle frames

ISO 7000, Graphical symbols for use on equipment -- Index and synopsis

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

IEC 60417, Graphical symbols for use on equipment

¹⁾ Currently at Committee Draft stage: Cross-references in ISO 12312-1 to ISO 12311 will be updated when the clause structure of ISO 12311 is finalised.

Terms and definitions 3

For the purposes of this international standard, the terms and the definitions given in ISO 4007 apply

Construction and materials 4

Construction 4.1

Areas of the sunglass that may, during intended use, come into contact with the wearer shall be smooth, without sharp protuberances, and all edges shall be rounded.

NOTE Area of the sunglass, including edges of the filters if in a rimless or semi-rimless style, that may, during intended use, come into contact with the wearer shall be smooth and without sharp protuberances.

Filter material and surface quality 4.2

Except in a marginal area 5 mm wide, sunglare filters shall have no material or machining defects within an area of 30 mm diameter around the reference point 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.

For possible test methods see clause 7.1 of ISO 12311 200x

4.3 Physiological compatibility

standardsist Sunglasses must 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 (and safety) of the wearer. The risks posed by substances leaking from the device that may come into prolonged contact with the skin must be reduced by the manufacturer to a minimum. Special attention shall be given to substances which are allergenic, .85 carcinogenic, mutagenic or toxic to reproduction.

Reactions may be generated by excessive pressure, chemical irritation or allergy. Rare or idiosyncratic NOTE 1 reactions may occur to any material and may indicate the need for the individual to avoid particular types of frames.

In some countries, specific material properties may be mandatory - (see annex C for nickel NOTE 2 release)

Transmittance 5

Test methods 5.1

Transmittance values shall be determined in accordance with ISO/TC94/SC6 N308.

Transmittance and filter categories 5.2

Depending upon their luminous transmittance at their reference point, sunglare filters for general use shall be attributed to one of five filter categories. Category 0 applies to:

- Filters with a luminous transmittance > 80% at the reference point, but where a specific protection against any part of the solar spectrum is claimed
- Photochromic filters with a luminous transmittance >80% at the reference point in the faded state.

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 1. 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 \pm 3 % absolute for the transmittance values falling in categories 0 to 3 and \pm 30 % relative to the stated value for the transmittance values falling in category 4.

When describing the transmittance properties of photochromic filters, two categories for transmittance values are generally used. These two values correspond to the faded state and to the darkened state of the filter.

In the case of gradient filters the transmittance value at the reference point shall be used to characterize the luminous transmittance and the category of the filter.

For gradient filters, the overlap in luminous transmittance allowed between categories shall be double that for uniformly tinted filters.

Table 1 specifies also the UV requirements for sunglare filters for general use and when the filters are claimed by the manufacturer to protect against IR radiation, the IR requirements.

Consumer Label	Technical Label	Requirements	Prop.all	15th 201-201-					
Descriptive label	Filter Category	Ultraviolet spectral range		Visible spect	Enhanced infrared absorption ^ª				
		Maximum value of solar UV-B transmittance	Maximum value of solar UV-A transmittance	Range of luminous transmittance		Maximum value of solar IR transmittance			
		TSUVB 10 09	TSUVA	τ _V		$ au_{SIR}$			
		280 nm to 5 1	315 nm to	from over	to %				
		315 nm	380 nm	70					
Light tint	0	0,05 τ _v	$ au_{\sf V}$	80,0	100	$ au_{\sf V}$			
sunglasses	1	0,05 τ _v	$ au_{\sf V}$	43,0	80,0	$ au_{v}$			
General purpose sunglasses	2	1,0% absolute or 0,05 τ_v , whichever is greater	0,5 <i>t</i> v	18,0	43,0	$ au_{ m V}$			
	3	1,0 % absolute	0,5 <i>τ</i> ν	8,00	18,0	$ au_{v}$			
Very dark special purpose sunglasses	4	1,0 % absolute	1,0% absolute or 0,25 τ _V , whichever is greater	3,00	8,00	τ _v			
^a Only applicable to sunglare filters recommended by the manufacturer as a protection against infrared radiation.									

Table 1 – Transmittance for sunglare filters for general use

NOTE The upper limit of UV-A at 380 nm coincides with that taken in ophthalmic optics and in ISO 20473:2007, *Optics and photonics -Spectral bands.*

5.3 General transmittance requirements

5.3.1 Uniformity of luminous transmittance

The relative difference in the luminous transmittance value between any two points of the filter within a circle 40 mm in diameter around the reference point or to the edge of the filter less the marginal zone 5 mm wide. whichever is greater, shall not be greater than 10 % (relative to the higher value), except for category 4 where it shall not be greater than 20 %.

The geometric or boxed centre takes the place of the reference point if this is not known.

In the case of mounted gradient filters, this requirement applies in a section parallel to the line connecting the two reference points.

For mounted filters the relative difference between the luminous transmittance value of the filters at the reference point for the right and left eyes shall not exceed 15 % (relative to the lighter filter).

Changes of luminous transmittance that are caused by thickness variations due to the design of the ocular are permitted.

5.3.2 Requirements for road use and driving

5.3.2.1 General

Filters suitable for road use and driving shall be of categories 0, 1, 2 or 3 and shall additionally meet the atalog standar J. standardi following three requirements.

5.3.2.2 Spectral transmittance driving shall be not less than 0.2 τ_{v} .

5.3.2.3 **Detection of signal lights**

The relative visual attenuation quotient Q of filters of categories 0, 1, 2 and 3 suitable for driving and road use shall be not less than 0,80 for red signal light, not less than 0,60 for yellow, green and blue signal light. The relative spectral distribution of radiation emitted by incandescent signal lights shall apply; see 8.2 of ISO 12311.

5.3.2.4 Driving in twilight or at night

Sunglare filters with a luminous transmittance less than 75 $\frac{10}{-2}$ % shall not be used for driving in twilight or at night. Photochromic sunglare filters are considered suitable for use at night if their luminous transmittance is 75 % or greater after testing as follows:

- a) Filters are conditioned as described in ISO/TC94/SC6 N308
- Filters are then exposed to $(15\ 000\ \pm\ 1\ 500)$ lux at $(23\ \pm\ 1)$ °C for 15 min b)
- Filters are then stored in the dark (23 ± 1) °C for 60 min. C)