



SLOVENSKI STANDARD
SIST EN 1836:1998/A2:2004

01-februar-2004

Osobna zaščita oči - Sončna očala, sončna očala za splošno uporabo in filtri za direktno opazovanje sonca

Personal eye protection - Sunglasses, sunglare filters for general use and filters for direct observation of the sun

Persönlicher Augenschutz - Sonnenbrillen, Sonnenschutzfilter für den allgemeinen Gebrauch und Filter für die direkte Betrachtung der Sonne

Protection individuelle de l'oeil - Lunettes solaires, filtres de protection contre les rayonnements solaires pour usage général et filtres pour l'observation directe du soleil

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Ta slovenski standard je istoveten z: EN 1836:1997/A2:2003

ICS:

13.340.20 Varovalna oprema za glavo Head protective equipment

SIST EN 1836:1998/A2:2004 en

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EUROPEAN STANDARD

EN 1836:1997/A2

NORME EUROPÉENNE

EUROPÄISCHE NORM

November 2003

ICS 13.340.20

English version

Personal eye protection - Sunglasses, sunglare filters for general use and filters for direct observation of the sun

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This amendment A2 modifies the European Standard EN 1836:1997; it was approved by CEN on 1 September 2003.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for inclusion of this amendment into the relevant national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Management Centre or to any CEN member.

This amendment exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and United Kingdom.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: rue de Stassart, 36 B-1050 Brussels

EN 1836:1997/A2:2003 (E)**Foreword**

This document (EN 1836:1997/A2:2003) has been prepared by Technical Committee CEN/TC 85 “Eye-protective equipment”, the secretariat of which is held by AFNOR.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

This Amendment to the European Standard EN 1836:1997 shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by May 2004 and conflicting national standards shall be withdrawn at the latest by May 2004.

For relationship with EU Directive(s), see informative annex ZA, which is an integral part of this document.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and the United Kingdom.

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Revised text

1 Scope

Add after the first sentence:

This standard specifies also requirements for filters for the direct observation of the sun (e. g. during eclipses).

2 Normative references

Change the dates of following references to:

EN 166:1995, EN 167:1995, EN 168:1995, EN 174:1996 all to year 2001

ISO 8624:1991 to year 2002

Add the following references:

EN 1811, *Reference test method for release of nickel from products intended to come into direct and prolonged contact with the skin.*

ENV 14027, *Method for the simulation of wear before the detection of nickel release from coated metal and combination spectacle frames.*

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3 Terms and definitions

Add the following the new definition 3.2 and renumber the old definition 3.2 as 3.3:

3.2

degree of polarisation, P

is defined as

$$P = \frac{\tau_{pmax} - \tau_{pmin}}{\tau_{pmax} + \tau_{pmin}}$$

where

τ_{pmax} the maximum values of luminous transmittance as determined with linearly polarised radiation;

τ_{pmin} the minimum values of luminous transmittance as determined with linearly polarised radiation.

Add the new definition 3.4 and renumber old definitions 3.3 to 3.8 as 3.5 to 3.10:

3.4

photochromic range, R_p

range given by the ratio of the difference of the luminous transmittance in the faded state τ_0 and the luminous transmittance in the darkened state τ_1 to the luminous transmittance in the faded state τ_0 :

$$R_p = \frac{\tau_0 - \tau_1}{\tau_0}$$

3.8

relative visual attenuation quotient for signal light recognition

Change "spectral visibility function" into "spectral luminous efficiency"

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Add the following new definition 3.11 and renumber old definitions 3.9 to 3.11 as 3.12 to 3.14:

3.10

Solar luminous reflectance ρ_v

The ratio ρ_v of the luminous flux reflected by the filter and the incident luminous flux. The basis for calculation this is the spectral luminous efficiency $V(\lambda)$. The values of the spectral luminous efficiency $V(\lambda)$ are given in ISO/CIE 10527:1991

$$\rho_v = \frac{\int_{380\text{nm}}^{780\text{nm}} \rho(\lambda) \cdot S_{D65\lambda}(\lambda) \cdot V(\lambda) \cdot d\lambda}{\int_{380\text{nm}}^{780\text{nm}} S_{D65\lambda}(\lambda) \cdot V(\lambda) \cdot d\lambda}$$

Modify the clause 4.1.3.3 as follows:

4.1.3.3 Gradient Filters

Gradient Filters shall meet the transmittance requirements within a 10 mm radius circle, around the reference point.

The filter category of gradient filters shall be determined by the luminous transmittance value at the reference point. The filter category determined at the reference point shall be used to define if the filters are suitable for road use and driving, according to 4.1.2.2.

Add a new paragraph and renumber existing Tables 2 to 5 as Tables 3 to 6:

4.1.3.4 Filters and eye protectors for the direct observation of the sun

The transmittance requirements and filter categories of filters for the direct observation of the sun are given in Table 2.

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Table 2 - Transmittance requirements for filters for the direct observation of the sun

Filter category	Requirements				
	Ultraviolet spectral range		Visible spectral range		Infrared spectral range
	280 nm to 315 nm	315 nm to 380 nm	Range of luminous transmittance τ_v		Maximum value of solar infrared transmittance τ_{SIR}
	Maximum value of spectral transmittance $\tau_{F(\lambda)}$	Maximum value of solar UVA transmittance τ_{SUVA}	from under	to	
			%	%	%
E12	τ_v	τ_v	0,003 2	0,001 2	3
E13			0,001 2	0,000 44	
E14			0,000 44	0,000 16	
E15			0,000 16	0,000 061	
E16			0,000 061	0,000 023	

In addition to the filter requirements of Table 2, only the following paragraphs of this standard apply to filters for the direct observation of the sun: 4.1.2.1, 4.2, 4.3, 4.4, 4.6 and 4.7. Frames shall comply with the requirements of 5.3 and 5.4.

NOTE The frame should hold the filters securely in front of the eyes.

Change the title of 4.1.4 to read:

4.1.4 Claimed transmittance and reflectance properties

Add a new paragraph:

4.1.4.3 Anti-reflection treated sunglasses

In the case where sunglasses are claimed to be anti-reflection treated, the solar luminous reflectance ρ_v of the filter as measured from the eye-side of the filter shall be less than 2,5 %.

5.4 Materials for the manufacture of complete sunglasses

Add text:

Those parts of metal and combination spectacle frames that come into direct and prolonged contact with the skin of the wearer shall have a nickel release of less than $0,5 \mu\text{g}/\text{cm}^2$ /week when tested according to EN 1811.

Before testing, parts of coated metal and combination spectacle frames that come into direct and prolonged contact with the skin shall be subject to method described in ENV 14027 for accelerated wear to simulate two years use.

Change the title of 6.1.1 to read:

6.1.1 Transmittance, filter category and reflectance

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Add a new paragraph : [https://standards.iteh.ai/catalog/standards/sist/ab3fddab-c25b-440a-9588-](https://standards.iteh.ai/catalog/standards/sist/ab3fddab-c25b-440a-9588-27b147f59a7/sist-en-1836-1998-a2-2004)

6.1.1.4 Eye-side reflectance

The spectral distribution of standard illuminant D 65 and the standard spectral values of the colorimetric 2° standard observer CIE 1931 according to ISO/CIE 10526:1991 shall be used to determine the luminous reflectance. The product of the spectral distribution of standard illuminant D 65 and the standard spectral values of the colorimetric 2° standard observer CIE 1931 according to ISO/CIE 10527:1991 shall be as given in annex B. Linear interpolation of these values for steps smaller than 10 nm is permissible.

Add the following new paragraph 6.1.3 and renumber existing 6.1.3.2 to 6.1.3.3 as 6.1.3.3 to 6.1.3.4:

6.1.3.2 Degree of polarisation

The maximum value luminous transmittance for linearly polarised light τ_{pmax} of the filter is determined using linearly polarised light, the plane of polarisation being orientated so that the luminous transmittance reaches its maximum value. The minimum value of luminous transmittance to polarised light τ_{pmin} of the filter is determined using linearly polarised light, the plane of polarisation being oriented so that the luminous transmittance reaches its minimum value.

Change the title of paragraph 7.1.1 to read:

7.1.1 Information to be supplied with each sunglass and eye protector for the direct observation of the sun

Add to paragraph 7.1.1:

- e) in the case of eye protectors for direct observation of the sun: the warning that direct viewing of the sun is dangerous. Projection techniques are safe. Alternatively, adequate eye protection specifically designed for viewing the sun is essential, and must be worn so that no direct radiation from the sun can reach the eye.
- f) unless the product complies with 4.1.3.4 the warning: "Not for direct viewing of the sun"

EN 1836:1997/A2:2003 (E)**7.1.2 Additional information to be supplied by the manufacturer**

Change b) to read:

- b) type and performance of the filter, e.g.:
- photochromic:
 - the luminous transmittance in the faded state τ_0 ;
 - the luminous transmittance in the darkened state τ_1 ;
 - and the photochromic range R_p as a measure for the photochromic performance;
 - polarising: the degree of polarisation in percent;
 - gradient.

Change the title of 7.3 to read:

7.3 Transmittance or reflectance claims

Any claims of specific transmittance or reflectance values shall be in accordance with the specifications given in section 4.1.4.

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A.1 Daytime

Delete the warning in A.1.

Insert a new paragraph A.3 and renumber old paragraphs A.3 to A.6 as A.4 to A.7.
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A.3 Direct observation of the sun

For the direct observation of the sun filters or eye protectors with categories E12 to E16 should be used. Welders protection filters as specified in EN 169 [8] with scale numbers 12 to 16 are equally suitable. Both filter types may also be used in conjunction with telescopes (preferably between the eye piece and the eye) for the observation of the sun. The selection of the category/scale number is a matter of personal preference in comfort (according to atmospheric conditions and personal glare sensitivity). Usually, filters with category E15 or scale number 15 should be most adequate.

Eye protectors for direct observation of the sun should be worn so that no direct radiation from the sun can reach the eye.