SLOVENSKI STANDARD

SIST EN ISO 8980-3:2014

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Nadomešča:
SIST EN ISO 8980-3:2005

Očesna optika - Nebrušena zglajena stekla očal - 3. del: Specifikacije za prepustnost in preskusne metode (ISO 8980-3:2013)

Ophthalmic optics - Uncut finished spectacle lenses - Part 3: Transmittance specifications and test methods (ISO 8980-3:2013)

Augenoptik - Rohkantige fertige Brillengläser - Teil 3: Transmissionsanforderungen und Prüfverfahren (ISO 8980-3:2013)

Optique ophtalmique - Verres de lunettes finis non détourés - Partie 3: Spécifications relatives au facteur de transmission et méthodes d'essai (ISO 8980-3:2013)

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ICS:

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English Version

Ophthalmic optics - Uncut finished spectacle lenses - Part 3: Transmittance specifications and test methods (ISO 8980-3:2013)

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

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

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Foreword

This document (EN ISO 8980-3:2013) has been prepared by Technical Committee ISO/TC 172 "Optics and photonics" in collaboration with Technical Committee CEN/TC 170 “Ophthalmic optics” the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by April 2014, and conflicting national standards shall be withdrawn at the latest by October 2016.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

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Endorsement notice

The text of ISO 8980-3:2013 has been approved by CEN as EN ISO 8980-3:2013 without any modification.

INTERNATIONAL STANDARD

ISO 8980-3

Third edition
2013-10-01

Ophthalmic optics — Uncut finished spectacle lenses —

Part 3: Transmittance specifications and test methods

Optique ophtalmique — Verres de lunettes finis non détourés — Partie 3: Spécifications relatives au facteur de transmission et méthodes d'essai

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ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

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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. www.iso.org/directives

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The committee responsible for this document is ISO/TC 172, *Optics and photonics*, Subcommittee SC 7, *Ophthalmic optics and instruments*.

This third edition cancels and replaces the second edition (ISO 8980-3:2003), which has been technically revised. In particular, the requirement in 6.3.2 for lenses intended for road use and driving has been amended with an extension of three years for the continued manufacture of existing products.

ISO 8980 consists of the following parts, under the general title *Ophthalmic optics — Uncut finished spectacle lenses*:

— *Part 1: Specifications for single-vision and multifocal lenses*

— *Part 2: Specifications for progressive power lenses*

— *Part 3: Transmittance specifications and test methods*

— *Part 4: Specifications and test methods for anti-reflective coatings*

— *Part 5: Minimum requirements for spectacle lens surfaces claimed to be abrasion-resistant*

Ophthalmic optics — Uncut finished spectacle lenses —

Part 3: Transmittance specifications and test methods

1 Scope

This part of ISO 8980 specifies requirements for the transmittance properties of uncut finished spectacle lenses and mounted pairs, including attenuation of solar radiation.

This part of ISO 8980 is not applicable to

— spectacle lenses having particular transmittance or absorption characteristics prescribed for medical reasons;

— products where specific personal protective equipment transmittance standards apply;

— products intended for direct observation of the sun, such as for solar-eclipse viewing.

NOTE Optical and geometric requirements for uncut finished spectacle lenses are specified in ISO 8980-1 and ISO 8980-2, and for mounted lenses, in ISO 21987.

2 Normative references

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

ISO 11664-1, *Colorimetry — Part 1: CIE standard colorimetric observers*

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

ISO 13666, *Ophthalmic optics — Spectacle lenses — Vocabulary*

ISO 14889, *Ophthalmic optics — Spectacle lenses — Fundamental requirements for uncut finished lenses*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 13666 apply.

NOTE 1 For the convenience of the reader, the following definitions have been reproduced from ISO 13666.

NOTE 2 Absorptance, reflectance and transmittance are usually expressed as percentages. The equations in this clause are written in this form. Although the definitions use integrals, in practice summation, typically at 1 nm, 5 nm or 10 nm intervals, is performed to calculate the various transmittances.

3.1
mean UV-A transmittance
τ_{UVA}
mean transmittance between 315 nm and 380 nm

$$\tau_{UVA} = 100 \times \frac{1}{65\ \text{nm}} \int_{315\ \text{nm}}^{380\ \text{nm}} \tau(\lambda) \cdot d\lambda\ \%$$

[ISO 13666:2012, definition 15.3.1]

3.2
solar UV-A transmittance
τ_{SUVA}
mean of the spectral transmittance between 315 nm and 380 nm weighted by the solar radiation distribution $E_S(\lambda)$ at sea level, for air mass 2, and the relative spectral effectiveness function for UV radiation $S(\lambda)$

$$\tau_{SUVA} = 100 \times \frac{\int_{315\ nm}^{380\ nm} \tau(\lambda) \cdot E_s(\lambda) \cdot S(\lambda) \cdot d\lambda}{\int_{315\ nm}^{380\ nm} E_s(\lambda) \cdot S(\lambda) \cdot d\lambda} \%$$

Note 1 to entry: The complete weighting function $W(\lambda)$ is the product of $E_S(\lambda)$ and $S(\lambda)$ and is given in Table B.1.

[SOURCE: ISO 13666:2012, definition 15.3.2]

3.3
solar UV-B transmittance
τ_{SUVB}
mean of the spectral transmittance between 280 nm and 315 nm weighted by the solar radiation distribution $E_S(\lambda)$ at sea level, for air mass 2, and the relative spectral effectiveness function for UV radiation $S(\lambda)$

$$\tau_{SUVB} = 100 \times \frac{\int_{280\ nm}^{315\ nm} \tau(\lambda) \cdot E_s(\lambda) \cdot S(\lambda) \cdot d\lambda}{\int_{280\ nm}^{315\ nm} E_s(\lambda) \cdot S(\lambda) \cdot d\lambda} \%$$

Note 1 to entry: The complete weighting function $W(\lambda)$ is the product of $E_S(\lambda)$ and $S(\lambda)$ and is given in Table B.1.

[SOURCE: ISO 13666:2012, definition 15.3.3]

3.4
luminous transmittance
τ_V
ratio of the luminous flux transmitted by the lens or filter to the incident luminous flux

$$\tau_V = 100 \times \frac{\int_{380\ nm}^{780\ nm} \tau(\lambda) \cdot V(\lambda) \cdot S_{D65}(\lambda) \cdot d\lambda}{\int_{380\ nm}^{780\ nm} V(\lambda) \cdot S_{D65}(\lambda) \cdot d\lambda} \%$$

where

$\tau(\lambda)$ is the spectral transmittance of the spectacle lens;

$V(\lambda)$ is the spectral luminous efficiency function for daylight (see ISO 11664-1);

$S_{D65}(\lambda)$ is the spectral distribution of radiation of CIE standard illuminant D65 (see ISO 11664-2).

Note 1 to entry: The spectral values of the product of the spectral radiation distributions $S_{D65}(\lambda)$ of the CIE standard illuminant D65 and the eye's spectral luminous efficiency function $V(\lambda)$ are given in Table A.2.

[SOURCE: ISO 13666:2012, definition 15.4]

3.5
relative visual attenuation coefficient (quotient) for incandescent traffic signal light recognition/detection
Q-value
ratio of the luminous transmittance of a tinted lens for the spectral radiant power distribution of the light emitted by a traffic signal τ_{signal} to the luminous transmittance of the same lens for CIE standard illuminant D65 (τ_V)

$$Q = \frac{\tau_{signal}}{\tau_V}$$

where

τ_{signal} is the luminous transmittance of the lens for the spectral radiant power distribution of the traffic signal light.

Note 1 to entry: *Q*-values can be determined for each of blue, green, amber (yellow) and red signal lights. τ_{signal} is given by the equation:

$$\tau_{signal} = 100 \times \frac{\int_{380\ nm}^{780\ nm} \tau(\lambda)\cdot\tau_S(\lambda)\cdot V(\lambda)\cdot S_A(\lambda)\cdot d\lambda}{\int_{380\ nm}^{780\ nm} \tau_S(\lambda)\cdot V(\lambda)\cdot S_A(\lambda)\cdot d\lambda}\ \%$$

where

$\tau_S(\lambda)$ is the spectral transmittance of the traffic signal lens;

$S_A(\lambda)$ is the spectral distribution of radiation of CIE standard illuminant A (or 3 200 K light source for blue signal light) (see ISO 11664-2);

Note 2 to entry: The spectral values of the products of the spectral distributions $S_A(\lambda)$ of the illuminant A, the spectral luminous efficiency function $V(\lambda)$ of the eye and the spectral transmittance $\tau_S(\lambda)$ of the traffic signal lens are given in Table A.1, where $E_{Signal}(\lambda)=S_A(\lambda)\times\tau_S(\lambda)$.

Note 3 to entry: Calculations are currently based on the measured values of $E(\lambda)$ for traffic signal lights using incandescent quartz-halogen lamps. They previously used the product $\tau_S(\lambda)\cdot S_A(\lambda)$ of the spectral transmittance of the traffic signal filter and the spectral distribution of radiation of CIE standard illuminant A. Calculations using the values for quartz-halogen lamps and LED signals will give different results

Note 4 to entry: Adapted from ISO 13666:2012, definition 15.5.

3.6
polarizing efficiency
property of a polarizing lens, describing the percentage of the transmitted light that is polarised, defined by the equation

$$P = 100 \times \frac{\tau_{p,max} - \tau_{p,min}}{\tau_{p,max} + \tau_{p,min}}\ \%$$

where