PD ISO/TR 20772:2018

BSI Standards Publication

Ophthalmic optics — Spectacle lenses — Short wavelength visible solar radiation and the eye

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National foreword

This Published Document is the UK implementation of ISO/TR 20772:2018.

The UK participation in its preparation was entrusted to Technical Committee CH/172/3, Spectacles.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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TECHNICAL REPORT

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Ophthalmic optics — Spectacle lenses — Short wavelength visible solar radiation and the eye

Optique ophtalmique — Verre de lunettes — L'œil et les radiations solaires visibles de courtes longueurs d'onde

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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.

This document was prepared by Technical Committee ISO/TC 172, *Optics and photonics*, Subcommittee SC 7, *Ophthalmic optics and instruments*.

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

Ongoing concern about unverifiable spectacle lens and sunglass marketing claims for blocking of wavelengths near to and greater than 380 nm (such as UV400 claims) was the main motivation for creating the present Technical Report.

The intention is to explain the specifications related to the filtering effects of lenses and filters that are given in the available International Standards — for the purposes of standardization in the fields of spectacle lenses and sunglasses, 380 nm is generally chosen as both the upper limit of the solar UV range and the lower limit of the visible range — and to provide information about the supporting science as it is best understood today.

The effects of UV radiation on the eye are well known, and have been considered in the technical requirements of the standards relating to tinted spectacle lenses (ISO 8980-3) and sunglasses (ISO 12312-1).

The commitment to create this document came from a resolution of the plenary meeting of ISO/TC 172/SC 7, *Ophthalmic optics and instruments* (responsible for spectacle lens standards) in 2009, and was jointly supported by ISO/TC 94/SC 6, *Eye and face protection* (responsible for sunglass standards). The related standards activity in these two committees is summarized in Clause 4, with more detail on the background and technical context leading up to the decision to create this document.

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TECHNICAL REPORT **ISO/TR 20772:2018**

Ophthalmic optics — Spectacle lenses — Short wavelength visible solar radiation and the eye

1 Scope

This document describes visible solar radiation with wavelengths close to the UV range, its transmission to, within and the effects on the human eye. The wavelengths concerned are from 380 nm to 500 nm, covering the colours of violet, indigo and blue — often referred to as the "blue wavelengths".

It also explains the filtering effects and measurement of spectacle lenses and sunglasses, thereby providing background information to understand the transmittance requirements related to filtering effects of lenses and filters in the available spectacle lens and sunglass standards.

This document does not address the issues of protection from artificial sources of radiation.

This document is intended to be of benefit to any future interest in ISO standardization related to transmission of solar radiation with wavelengths near to and greater than 380 nm.

The Bibliography provides a source of relevant useful references.

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 4007, *Personal protective equipment — Eye and face protection — Vocabulary*

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

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 4007 and ISO 13666 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/

4 Preliminaries: UV400 and alpha-blocking wavelength in standardization

This is a summary of the standards activity in ISO/TC 172/SC 7, *Ophthalmic optics and instruments* (responsible for spectacle lens standards) and ISO/TC 94/SC 6, *Eye and face protection* (responsible for sunglass standards) relating to claims such as UV400, and the attempts to define the term *alpha-blocking wavelength*. It provides the background leading up to the decision to create this document.

Nominal wavelength regions of the electro-magnetic spectrum have been adopted by various agencies and organizations for convenience in communication. In a number of fields (e.g. CIE, ICNIRP, IEC and disciplines such as cosmetics and dermatology) the UV region is considered to extend to 400 nm, overlapping with the CIE definition of visible light.

For the purposes of standardization in the fields of spectacle lenses and sunglasses, 380 nm is generally chosen as both the upper limit of the solar UV range and the lower limit of the visible range.