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Optics and Photonics — Bulk absorption optical filters

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The UK participation in its preparation was entrusted to Technical Committee CPW/172, Optics and Photonics.

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

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Foreword

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This document was prepared by Technical Committee ISO/TC 172, *Optics and photonics*, Subcommittee SC 3, *Optical materials and components*.

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Introduction

The optical properties of a bulk absorption filter are characterized by spectrophotometric values. These values relate to the energy transported by electromagnetic waves (radiant or luminous) and they vary as a function of wavelength. Additional influences can be caused by scattering.

NOTE 1 The functional spectral dependency is generally indicated by including the wavelength, λ, in parentheses as part of the symbol.

NOTE 2 The wavelength, λ, can be replaced by the wavenumber, σ, or the photon energy, $h\nu$, h = Planck constant; ν = frequency. The units recommended are the nanometre (nm) or the micrometre (µm) for the wavelength, the reciprocal centimetre (cm^{-1}) for the wavenumber and the electron volt (eV) for the photon energy. Bulk absorption filters are defined according to their function, i.e. according to the nature of the principal modification of the spectral transmission (see Table 1).

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Optics and Photonics — Bulk absorption optical filters

1 Scope

This document specifies filter functions of uncoated bulk absorption filters for optical applications excluding ophthalmic optics (spectacles) and gives a standard form for their specification. Additionally, basic definitions and a description of the specification concerning optical bulk absorption filters are given.

This document specifies the optical properties of the filters and the test and measurement methods whenever necessary.

This document does not specify any material properties (internal quality, homogeneity, etc.) and it does not apply to any production method.

This document applies to both the raw material (filter glass, filter plastics, etc.) and the polished component.

NOTE 1 Colorimetric parameters for the description of the filter function are specified in e.g. ISO 11664-1 and ISO 11664-2.

NOTE 2 For filters where the spectral transmission characteristics are achieved by the application of optical coatings, see ISO 9211 series.

NOTE 3 In the case of high power applications, further optical effects may occur.

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 9211-1, *Optics and photonics — Optical coatings — Part 1: Vocabulary*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 9211-1 and the following terms and definitions 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/.

3.1 Boundary conditions

3.1.1
optical surface
optically effective surface, into which the radiation enters the bulk absorption filter or from which it leaves

Note 1 to entry: In general, bulk absorption filters are made as plane parallel plates and have two optical surfaces which are opposite to each other.

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