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Optics and optical instruments — Reference wavelengths

Optique et instruments d'optique — Longueurs d'onde de référence

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Foreword

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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.

International Standard ISO 7944 was prepared by Technical Committee ISO/TC 172, *Optics and optical instruments*.

This second edition cancels and replaces the first edition (ISO 7944:1984), which has been technically revised.

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International Organization for Standardization
Case postale 56 • CH-1211 Genève 20 • Switzerland
Internet iso@iso.ch

Printed in Switzerland

Optics and optical instruments — Reference wavelengths

1 Scope

This International Standard specifies two reference wavelengths to be used for the characterization of optical materials, optical systems and instruments, as well as ophthalmic lenses. It defines the associated principal refractive indices and principal dispersions, as well as the Abbe numbers with regard to these reference wavelengths and principal dispersions.

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2 Reference wavelengths, principal dispersions and Abbe numbers

2.1 General

The reference wavelengths are the mercury e-line 546,07 nm (see 2.2) and the helium d-line 587,56 nm (see 2.3).

For non-ophthalmic applications the mercury e-line shall be the reference wavelength.

Other wavelengths which may be used in addition to these reference wavelengths are given in tables 1, 2 and 3.

NOTE For the future, it is envisaged that only one reference wavelength is to be specified, even for ophthalmic use.

2.2 Mercury e-line 546,07 nm

The associated principal refractive index n_e is the refractive index at the green mercury e-line and the associated principal dispersion is $n_{F'} - n_{C'}$,

where

$n_{F'}$ is the refractive index at the blue cadmium F'-line;

$n_{C'}$ is the refractive index at the red cadmium C'-line.

The Abbe number ν_e with regard to this reference wavelength and this principal dispersion is defined as:

$$\nu_e = \frac{n_e - 1}{n_{F'} - n_{C'}}$$

2.3 Helium d-line 587,56 nm

The associated principal refractive index n_d is the refractive index at the yellow helium d-line and the associated principal dispersion is $n_F - n_C$,

where

n_F is the refractive index at the blue hydrogen F-line;