

INTERNATIONAL STANDARD

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Optics and optical instruments — Contact lenses — Determination of the spectral and luminous transmittance

*Optique et instruments d'optique — Lentilles de contact —
Détermination du facteur spectral de transmission et du facteur relatif de
transmission dans le visible*



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 8599 was prepared by Technical Committee ISO/TC 172, *Optics and optical instruments*, Subcommittee SC 7, *Ophthalmic, endoscopic, metrological instruments and test methods*.

Annex A of this International Standard is for information only.

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Optics and optical instruments — Contact lenses — Determination of the spectral and luminous transmittance

1 Scope

This International Standard specifies a method for determining the spectral transmittance and the luminous transmittance of contact lenses.

2 Normative reference

The following standard contains provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent edition of the standard indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 8320:1986, *Optics and optical instruments — Contact lenses — Vocabulary and symbols*.

3 Definitions

For the purposes of this International Standard, the definitions given in ISO 8320 and the following definitions apply.

3.1 spectral transmittance, $\tau(\lambda)$: Ratio of the transmitted spectral radiant flux, $\Phi_{e\lambda\tau}$, to the incident spectral radiant flux, $\Phi_{e\lambda}$:

$$\tau(\lambda) = \frac{\Phi_{e\lambda\tau}}{\Phi_{e\lambda}} \quad \dots (1)$$

where

$$\Phi_{e\lambda} = \frac{d\Phi_e}{d\lambda}$$

$$\Phi_{e\lambda\tau} = \frac{d\Phi_{e\tau}}{d\lambda}$$

3.2 luminous transmittance, τ : Ratio of the transmitted luminous flux, Φ_τ , to the incident luminous flux, Φ :

$$\tau = \frac{\Phi_\tau}{\Phi} = \frac{\int_{\lambda=380 \text{ nm}}^{780 \text{ nm}} (\Phi_{e\lambda})_{\text{rel}} \tau(\lambda) V(\lambda) d\lambda}{\int_{\lambda=380 \text{ nm}}^{780 \text{ nm}} (\Phi_{e\lambda})_{\text{rel}} V(\lambda) d\lambda} \quad \dots (2)$$

4 Principle

4.1 Spectral transmittance

In practice, the measurement of the spectral transmittance, $\tau(\lambda)$, is taken over a small range of wavelength $\Delta\lambda$, for which the associated radiant flux $\Delta\Phi_e$ is given by $\Delta\Phi_e = \Phi_{e\lambda}\Delta\lambda$. In order to determine the spectral transmittance, $\tau(\lambda)$, the radiant flux relative to the wavelength both with and without the contact lens is measured and $\tau(\lambda)$ calculated from equation (1).

4.2 Luminous transmittance

In the case of luminous transmittance, the relative spectral luminous efficiency, $V(\lambda)$, of the human eye is the criterion for the assessment of the radiation.

The value of Φ is always dependent upon the relative spectral distribution of the radiator used (illuminant), which is given by $(\Phi_{e\lambda})_{\text{rel}}$. For this reason, the standard illuminant has to be indicated.