
**Ophthalmic optics and instruments —
Reporting aberrations of the human eye**

*Optique et instruments ophtalmiques — Méthodes de présentation des
aberrations de l'œil humain*



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Published in Switzerland

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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.

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ISO 24157 was prepared by Technical Committee ISO/TC 172, *Optics and photonics*, Subcommittee SC 7, *Ophthalmic optics and instruments*.

Ophthalmic optics and instruments — Reporting aberrations of the human eye

1 Scope

This International Standard specifies standardized methods for reporting aberrations of the human eye.

2 Normative references

The following referenced documents are indispensable for the application 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 8429, *Optics and optical instruments — Ophthalmology — Graduated dial scale*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply. Symbols used are summarized in Table 1.

3.1

line of sight

line from the point of interest in object space to the centre of the entrance pupil of the eye and continuing from the centre of the exit pupil to the retinal point of fixation (generally the foveola)

3.2

Zernike polynomial function

one of a complete set of functions defined and orthogonal over the unit circle, the product of three terms, a normalization term, a radial term and a meridional term, parameterized by a dimensionless radial parameter, ρ , and a dimensionless meridional parameter, θ , designated by a non-negative radial integer index, n , and a signed meridional index, m , and given by the equation

$$Z_n^m = N_n^m R_n^{|m|}(\rho) M(m\theta) \quad (1)$$

where

N_n^m is the normalization term;

$R_n^{|m|}$ is the radial term;

$M(m\theta)$ is the meridional term;

the parameter ρ is a real number continuous over its range of 0 to 1,0;

the parameter θ is a real number continuous over its range of 0 to 2π .

NOTE For a given value of radial index n , the meridional index m may only take the values $-n, -n+2, \dots, n-2$ and n .