BSI Standards Publication

Optics and photonics — Test method for temperature coefficient of refractive index of optical glasses

Part 2: Interferometric method

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National foreword

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

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Optics and photonics — Test method for temperature coefficient of refractive index of optical glasses —

Part 2: Interferometric method

Optique et photonique — Méthode d'essai pour déterminer le coefficient de température de l'indice de réfraction des verres optiques —

Partie 2: Méthode interférométrique

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ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

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Optical glass is widely used in optical devices such as cameras, telescopes, and microscopes, and its refractive index is measured by the minimum deviation method (ISO 21395-1[4]) and the V-block refractometer method (ISO 21395-2[5]). Here, when designing an optical apparatus that requires high resolution, it is necessary to consider the temperature change of the refractive index of the optical glass in the usage environment. This document proposes a method for measuring the temperature coefficient of refractive index of optical glass with high accuracy.

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1 Scope

This document specifies a test method for the temperature coefficient of refractive index of optical glass using interferometry. Temperature changes in optical glass lead to changes in the optical path length. The change in optical path length can be measured with an interferometer using the number of cycles of light/dark change of the interference stripe. This document defines a test method to measure the amount of change in the refractive index when the temperature of the specimen is changed continuously.

The intended temperature range for the specified measurement method is an arbitrary range.

The intended wavelength range for the specified measurement method is 365 nm to 1 014 nm.

The intended accuracy for the specified measurement method is within 1×10^{-6} K^{-1}.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1
temperature coefficient of refractive index
ratio of refractive index change to temperature change at a selected wavelength

[SOURCE: ISO 9802:2022[3], 3.4.2.3, 3.4.2.4, modified — term and definition slightly reworded.]

3.2
temperature coefficient of absolute refractive index
$\Delta n_{abs}/\Delta T$
ratio of refractive index change in vacuum to temperature change at a selected wavelength

[SOURCE: ISO 9802:2022[3], 3.4.2.3, modified — term reworded.]