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**Optics and optical instruments —
Preparation of drawings for optical
elements and systems —**

Part 4:

**Material imperfections — Inhomogeneity and
striae**

*Optique et instruments d'optique — Indications sur les dessins pour
éléments et systèmes optiques —*

Partie 4: Imperfections des matériaux — Hétérogénéité et stries



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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.

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 10110-4 was prepared by Technical Committee ISO/TC 172, *Optics and optical instruments*, Subcommittee SC 1, *Fundamental standards*.

ISO 10110 consists of the following parts, under the general title *Optics and optical instruments — Preparation of drawings for optical elements and systems*:

- *Part 1: General*
- *Part 2: Material imperfections — Stress birefringence*
- *Part 3: Material imperfections — Bubbles and inclusions*
- *Part 4: Material imperfections — Inhomogeneity and striae*
- *Part 5: Surface form tolerances*
- *Part 6: Centring tolerances*
- *Part 7: Surface imperfection tolerances*
- *Part 8: Surface texture*

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- *Part 9: Surface treatment and coating*
- *Part 10: Table representing data of a lens element*
- *Part 11: Non-toleranced data*
- *Part 12: Aspheric surfaces*
- *Part 13: Laser irradiation damage threshold*

Annex A of this part of ISO 10110 is for information only.

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Optics and optical instruments — Preparation of drawings for optical elements and systems —

Part 4: Material imperfections — Inhomogeneity and striae

1 Scope

ISO 10110 specifies the presentation of design and functional requirements for optical elements in technical drawings used for manufacturing and inspection.

This part of ISO 10110 specifies rules for the indication of allowable inhomogeneity and striae in optical elements.

2 Definitions

For the purposes of this part of ISO 10110, the following definitions apply.

2.1 inhomogeneity: Gradual variation of the refractive index within an optical element, defined as the difference between maximum and minimum values of the refractive index within the element.

NOTE — Inhomogeneity is caused by a variation of the chemical composition and other effects within the bulk material.

2.2 striae: Inhomogeneities having small spatial extent.

NOTE — Striae can appear in the form of sharply defined cordlike regions, especially when the glass was made by the clay-pot melting process. The tank melting process, which can cause band-like striae structures, is more common today for production of optical glass.

3 Specification

3.1 Classes of inhomogeneity

Measurement of the inhomogeneity within an optical element is often difficult to carry out in a nondestructive manner. Therefore the specification of an inhomogeneity class for an optical element is primarily useful for the selection of the raw material.