

Implementation of
ISO 10110-1:1996

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

Part 1: General

ICS 37.020

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Committees responsible for this British Standard

The preparation of this British Standard was entrusted to Technical Committee CPW/172, Optics and optical instruments, upon which the following bodies were represented:

- AEA Technology
- Association of Industrial Laser Users
- British Computer Society
- British Measurement and Testing Association
- College of Optometrists
- Department of Trade and Industry (Eureka 643)
- Department of Trade and Industry (National Physical Laboratory)
- Engineering Equipment and Materials Users' Association
- Flat Glass Manufacturers' Association
- Institute of Physics
- Ministry of Defence
- Scottish Optoelectronics Association
- Sira Limited
- Society of British Aerospace Companies Limited
- United Kingdom Laser and Electro-optic Association

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National foreword

This British Standard reproduces verbatim ISO 10110-1:1996 and implements it as the UK national standard.

This British Standard is published under the direction of the Consumer Products and Services Sector Board whose Technical Committee CPW/172 has the responsibility to:

- aid enquirers to understand the text;
- present to the responsible international committee any enquiries on interpretation, or proposals for change, and keep UK interests informed;
- monitor related international and European developments and promulgate them in the UK.

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, the ISO title page, pages ii to iv, pages 1 to 20 and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

INTERNATIONAL
STANDARD

ISO
10110-1

First edition
1996-03-15

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

Part 1:
General

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

Partie 1: Généralités



Reference number
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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 10110-1 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;*
- *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.*

Annexes A and B of this part of ISO 10110 are for information only.

1 Scope

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

This part of ISO 10110 specifies the presentation in drawings of the characteristics, especially the tolerances, of optical elements and systems.

Rules for preparation of technical drawings as well as for dimensioning and tolerancing are given in various International Standards. These general standards apply to optical elements and systems only if the necessary rules are not given in the various parts of ISO 10110.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 10110. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO 10110 are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 406:1987, *Technical drawings — Tolerancing of linear and angular dimensions*.

ISO 8015:1985, *Technical drawings — Fundamental tolerancing principle*.

ISO 10110-2:1996, *Optics and optical instruments — Preparation of drawings for optical elements and systems — Part 2: Material imperfections — Stress birefringence*.

ISO 10110-3:1996, *Optics and optical instruments — Preparation of drawings for optical elements and systems — Part 3: Material imperfections — Bubbles and inclusions*.

ISO 10110-4:—¹⁾, *Optics and optical instruments — Preparation of drawings for optical elements and systems — Part 4: Material imperfections — Inhomogeneity and striae*.

ISO 10110-5:1996, *Optics and optical instruments — Preparation of drawings for optical elements and systems — Part 5: Surface form tolerances*.

ISO 10110-6:1996, *Optics and optical instruments — Preparation of drawings for optical elements and systems — Part 6: Centring tolerances*.

ISO 10110-12:—¹⁾, *Optics and optical instruments — Preparation of drawings for optical elements and systems — Part 12: Aspheric surfaces*.

¹⁾ To be published.

3 Fundamental stipulations

All indications in drawings for optical elements and systems shall apply to the finished product, i.e. to its final form, except where other parts of ISO 10110 stipulate otherwise, as for example in ISO 10110-8.

Whenever details or symbols specified in this International Standard are found to be inadequate to clearly define the requirement, the information should be supplemented by a note or special instruction.

All linear dimensions are in millimetres, unless otherwise stated.

All optical data refer to the wavelength of the green mercury e-line ($\lambda = 546,07 \text{ nm}$), in accordance with ISO 7944, and to an ambient temperature of $22^\circ\text{C} \pm 2^\circ\text{C}$, unless specified otherwise.

Unless specified elsewhere, the omission of a requirement from the drawing shall indicate that the provisions of ISO 10110-11 apply.

Because of the existence of older (national) standards for optical drawings, a possibility of incorrect interpretation of data may exist. For this reason, a reference to ISO 10110 shall appear on each drawing in the form

“Indications in accordance with ISO 10110”

or

“Ind. acc. ISO 10110”

This indication should preferably be associated with the title of the drawing (see annex A and ISO 10110-10, Figure 1 to Figure 3).

4 Presentation and dimensioning

4.1 Views

Optical elements shall preferably be shown with incident light entering from the left. The optical axis shall be horizontal if possible. The preferred method is that components should be drawn in cross-section and hatched with short-long-short strokes. Back edges and hidden lines should normally be omitted (see Figure 1). However, for the sake of clarity, it may be necessary to include such lines in the case of non-rotationally symmetric elements.