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

**Part 1:
General**

*Optique et photonique — Indications sur les dessins pour éléments et
systèmes optiques —*

Partie 1: Généralités



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ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. 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.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

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

This second edition cancels and replaces the first edition (ISO 10110-1:1996) which has been technically revised.

ISO 10110 consists of the following parts, under the general title *Optics and photonics — 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 optical elements and cemented assemblies*
- *Part 11: Non-toleranced data*
- *Part 12: Aspheric surfaces*
- *Part 14: Wavefront deformation tolerance*
- *Part 17: Laser irradiation damage threshold*

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

Part 1: General

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 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 128-24, *Technical drawings — General principles of presentation — Part 24: Lines on mechanical engineering drawings*

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

ISO 7944, *Optics and optical instruments — Reference wavelengths*

ISO 8015, *Technical drawings — Fundamental tolerancing principle*

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

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

ISO 10110-4, *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 10110-7, *Optics and optical instruments — Preparation of drawings for optical elements and systems — Part 7: Surface imperfection tolerances*

ISO 10110-10:2004, *Optics and optical instruments — Preparation of drawings for optical elements and systems — Part 10: Table representing data of optical elements and cemented assemblies*

ISO 10110-11, *Optics and optical instruments — Preparation of drawings for optical elements and systems — Part 11: Non-toleranced data*

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

ISO 13715, *Technical drawings — Edges of undefined shape — Vocabulary and indications*

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 reference wavelength given in ISO 7944, and to the reference temperature of 20 °C¹⁾, 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”

These indications should preferably be associated with the title of the drawing (see Annex A and ISO 10110-10:2004, Figures 1 to 7).

4 Presentation and dimensioning

4.1 Views

Optical elements shall be shown with incident light entering from the left and the optical axis horizontal, unless otherwise specified.

The preferred method is that components 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.

1) 20 °C is the reference temperature in accordance with ISO 1. In the 1996 edition of ISO 10110-1, the default value for the reference temperature was 22 °C.