American National Standard

for Optics and Electro-Optical Instruments – Preparation of drawings for optical elements and systems – Part 1: General

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Secretariat
Optics and Electro-Optics Standards Council

Approved 2011
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American National Standard

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Foreword to the American National Standard edition

This national standard establishes uniform practices for drawing notations for optical elements and assemblies. It is based entirely on the international standard, ISO 10110-1:2006.

In its implementation as a national standard, however, some accommodations must be made for standard practice in the United States, and several provisions of ISO 10110-1:2006 are superseded by more applicable national standards already in circulation. This requires the following modifications in interpretation.

1) When using this standard, the indications notation described in section 3 is modified to read “Indications in accordance with ANSI/OEOSC OP1.110” or “Ind. acc. ANSI/OEOSC OP1.110.”

2) Unless explicitly specified, the provisions of ISO 10110-11 do not apply. The normative reference for ISO 10110-11 should be considered informative.

3) The default wavelength in the United States is the red HeNe line, 632.8 nm. The normative reference for ISO 7944 should be considered informative. A note should be included on the drawing indicating the wavelength, for example “Reference wavelength λ = 632.8 nm.”

4) The decimal point may be used instead of the decimal comma. These two notations should not be mixed on a single drawing.

5) Alternative notations are allowed for glass properties. If desired, the material birefringence, bubbles and inclusions, inhomogeneity and/or striae can be specified using ANSI/OEOSC OP3.001. When this is desired, the symbols and notations defined in that standard are used in place of 0/, 1/, and/or 2/. In this case, an additional note shall be added to the drawing clarifying which glass standard notation is in effect. Since alternative notations are offered in the areas of glass properties the normative references for ISO 10110-2, ISO 10110-3, and ISO 10110-4 should be considered informative.

6) Alternative notations are allowed for surface imperfections. If desired, the surface quality properties can be specified using ANSI/OEOSC ASC/OP1.002. When this is desired the symbols and notations defined in that standard are used after the indication 5/ and a note shall be added to the drawing clarifying which surface imperfection standard notation is in effect; e.g. 5/80-50 per ANSI/OEOSC OP1.002. Since alternative notations are offered in the area of surface imperfections, the normative reference for ISO 10110-7 should be considered informative.

In the interests of facilitating the use of this standard, the original text of ISO 10110-1 has not been modified except for US spelling and the substitution of the decimal point for the decimal comma. Instead, the changes which differentiate the American National Standard version from the ISO version have been identified with a note following each section requiring modification. These notes are marked “ANS Note” so that they are not confused with the notes in the original document.

Suggestions for improvement of this standard are welcome. They should be sent to the Optics and Electro-Optics Standards Council, P.O. Box 25705, Rochester, NY 14625-0705.

David Aikens, Chairperson
Gene Kohlenberg, Secretary
David Aikens, Task Force Leader

This standard was processed and approved for submittal to ANSI by the OEOSC Committee on Optics and Electro-Optical Instruments, OP. Committee approval of the standard does not necessarily imply that all committee members voted for its approval. At the time it approved this standard, the OP Committee had the following members:

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ANSI/OEOSC OP1.0110-1 (ISO 10110-1 MOD)

ISO Second edition
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Optics and Electro-Optical Instruments — Preparation of drawings for optical elements and systems —

Part 1:
General

Reference number

ISO 10110-1:2006(E)

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Foreword to the ISO Edition

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: Centering 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 13: Wavefront deformation tolerance

Part 14: Laser irradiation damage threshold

Optics and Electro-Optical Instruments — 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: Centering tolerances*