

INTERNATIONAL
STANDARD

ISO
10110-11

First edition
1996-03-15

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

Part 11:
Non-toleranced data

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

Partie 11: Données non tolérancées



Reference number
ISO 10110-11:1996(E)

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 10110-11 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*

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- Part 10: Table representing data of a lens element
- Part 11: Non-toleranced data
- Part 12: Aspheric surfaces
- Part 13: Laser irradiation damage threshold

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

Part 11: Non-toleranced data

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 permissible deviations and material imperfections when these are not explicitly indicated.

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 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 10110-7:1996, *Optics and optical instruments — Preparation of drawings for optical elements and systems — Part 7: Surface imperfection tolerances.*

ISO 10110-8:—¹⁾, *Optics and optical instruments — Preparation of drawings for optical elements and systems — Part 8: Surface texture.*

ISO 10110-13:—¹⁾, *Optics and optical instruments — Preparation of drawings for optical elements and systems — Part 13: Laser irradiation damage threshold.*

3 Permissible deviations and material imperfections

Complete functional properties of an optical element, dimensions and tolerances as well as material properties should be indicated in optical drawings.

1) To be published.

The permissible deviations and material imperfection tolerances which apply when such qualities are not specified are given in table 1.

NOTE 1 In cases in which the values given in table 1 are appropriate, the drawing may be simplified by omission of their indications.

These tolerances do not represent absolute limits. Even looser tolerances may be used; however they shall then be indicated in the drawing.

If a drawing of an optical part contains no indication of qualities mentioned in the various parts of ISO 10110, the values of table 1 are to be applied.

Table 1 — Permissible deviations and material imperfections in case explicit indications are not given

Property	Range of maximum (diagonal) dimension of the part			
	mm			
	up to 10	over 10 up to 30	over 30 up to 100	over 100 up to 300
Edge length, diameter (mm)	± 0,2	± 0,5	± 1	± 1,5
Thickness (mm)	± 0,1	± 0,2	± 0,4	± 0,8
Angle deviation of prisms and plate	± 0° 30'	± 0° 30'	± 0° 30'	± 0° 30'
Width of protective chamfer (mm)	0,1 to 0,3	0,2 to 0,5	0,3 to 0,8	0,5 to 1,6
Stress birefringence in accordance with ISO 10110-2 (nm/cm)	0/20	0/20	—	—
Bubbles and inclusions in accordance with ISO 10110-3	1/3 × 0,16	1/5 × 0,25	1/5 × 0,4	1/5 × 0,63
Inhomogeneity and striae in accordance with ISO 10110-4	2/1;1	2/1;1	—	—
Surface form tolerances in accordance with ISO 10110-5	3/5(1)	3/10(2)	3/10(2) (all Ø 30)	3/10(2) (all Ø 60)
Centring tolerances in accordance with ISO 10110-6	4/30'	4/20'	4/10'	4/10'
Surface imperfection tolerances in accordance with ISO 10110-7	5/3 × 0,16	5/5 × 0,25	5/5 × 0,4	5/5 × 0,63
Key				
—: No specification				
NOTES				
1 The surface texture specifications for an optical element (see ISO 10110-8) shall always be given in the drawing; no implicit indication for surface texture is therefore given in this part of ISO 10110.				
2 This part of ISO 10110 does not provide implicit specifications for laser irradiation damage threshold (see ISO 10110-13).				

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