INTERNATIONAL STANDARD

ISO 10110-10

First edition
1996-03-15

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

Part 10: Table representing data of a lens element

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

Partie 10: Tableau représentant les données d'une lentille

Reference number
ISO 10110-10:1996(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 10110-10 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*

International Organization for Standardization
Case Postale 56 • CH-1211 Genève 20 • Switzerland

Printed in Switzerland

— *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.

This page intentionally left blank

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

Part 10:
Table representing data of a lens element

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 a format for indicating the dimensions, permissible deviations, and material imperfections of a lens element in tabular form.

2 Format

The drawing shall be sub-divided into three fields (see figure 1).

2.1 Drawing field

In this field, a schematic drawing of the lens element shall be given, together with all information not given in the table field. It is not necessary that the drawing be true-to-scale; if a drawing scale factor is indicated, the drawing shall be a true-to-scale technical drawing.

Note that the datum axis for centring and the surface texture specification (see ISO 10110-6 and ISO 10110-8) are to be indicated on the drawing.

2.2 Table field

This field contains dimensions, tolerances, and permissible material imperfections of the lens element. It is sub-divided into three subfields.

The left subfield refers to the left surface of the lens element.

The central subfield refers to material specifications.

The right subfield refers to the right surface of the lens element.

Table 1 describes in detail the properties which may be indicated.

2.3 Title field

This field is provided for general indications such as name, type and/or reference number of the lens element, part number and scale (if any) of the drawing, and for a reference to ISO 10110.

3 Non-toleranced data

All properties which are specified neither in the drawing field nor in the table field are covered by ISO 10110-11.

4 Examples

Figures 2 and 3 give examples of the tabular indication of data for lens elements.

Table 1 — Properties to be listed

Items	Description
Material	Type, name, identification number of the material
n ν	If appropriate, refractive index and Abbe number (and tolerances) in accordance with ISO 7944
R	Radius of curvature with tolerance, if desired. The direction of curvature shall be indicated as follows: convex surface: CX concave surface: CC
$\varnothing_e$	Optically effective diameter
Protective chamfer	Minimum and maximum permissible widths of the protective chamfer
(λ)	Surface treatment and coating in accordance with ISO 10110-9
0/	Stress birefringence tolerance in accordance with ISO 10110-2
1/	Indication of permissible bubbles and other inclusions in accordance with ISO 10110-3
2/	Inhomogeneity and striae classes in accordance with ISO 10110-4
3/	Surface form tolerance in accordance with ISO 10110-5
4/	Centring tolerance in accordance with ISO 10110-6
5/	Surface imperfection tolerance in accordance with ISO 10110-7
6/	Laser irradiation damage threshold indication in accordance with ISO 10110-13 (if appropriate)
	If appropriate, the words "To be cemented" shall be added

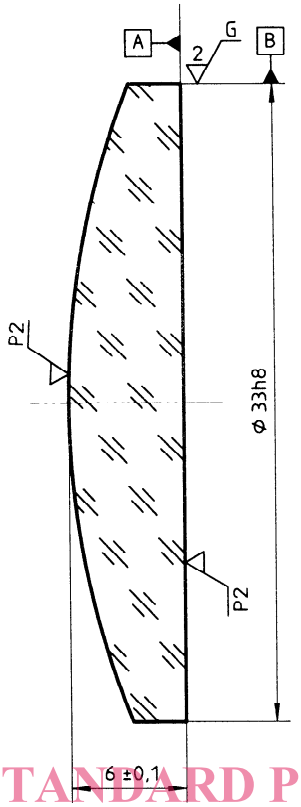
Drawing field
Indications in accordance with 3.1

Table field
Indications in accordance with 3.2

Left surface	Material specification	Right surface
R		R
$Ø_e$		$Ø_e$
Protective chamfer	n	Protective chamfer
Ⓛ	v	Ⓛ
3/	0/	3/
4/	1/	4/
5/	2/	5/
6/*		6/*
To be cemented*		To be cemented*
Indications in accordance with ISO 10110	*Title field* *Indications in accordance with 3.3*	

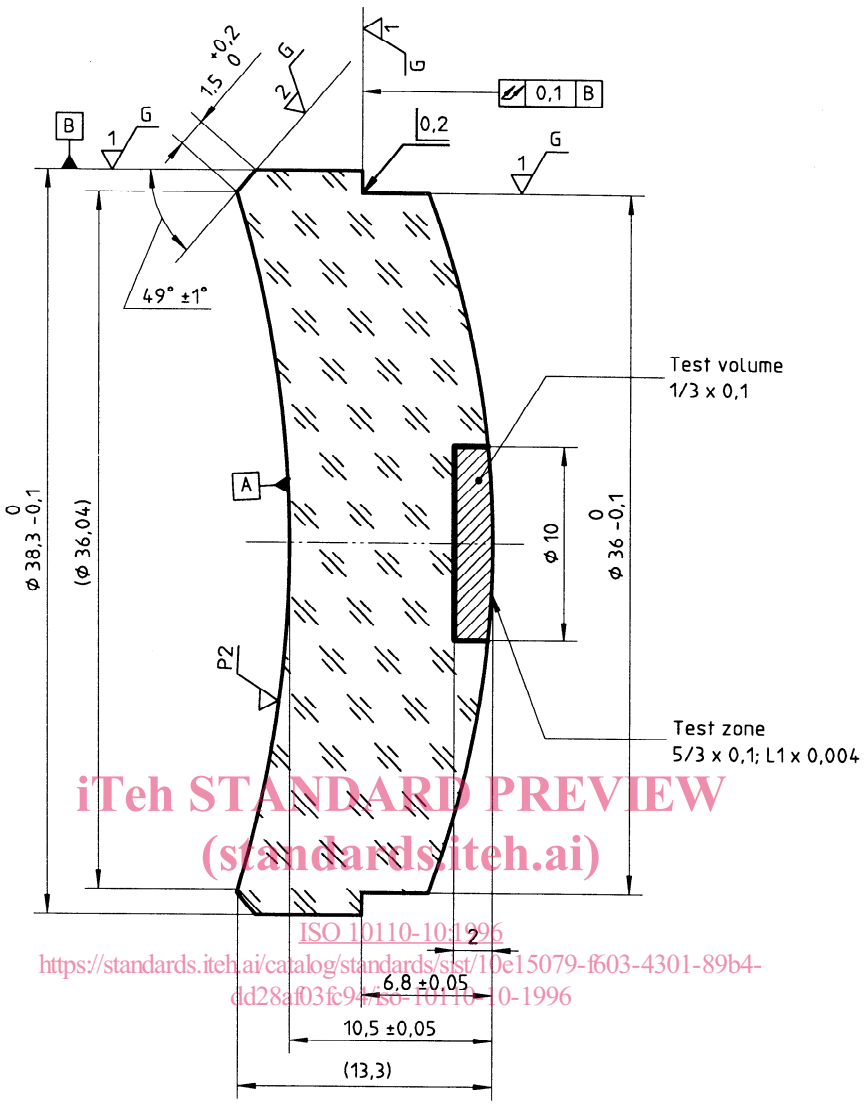
* (if required)

Figure 1 — Tabular indication of data for a lens element



Left surface	Material specification	Right surface
R 37,449 CX $Ø_e$ 30,5 Protective chamfer 0,4 – 0,6 Ⓛ AR 209.1060 3/ 5(1) 4/ 1,4′ 5/ 5 × 0,1; C 5 × 0,16; L 3 × 0,004; E 0,4 6/ 6 KWcm^{-2}; 1 060 nm; 10	Hoya LaC9 or Schott LaK9 n (1 060 nm) 1,675 9 ± 0,001 *v* — 0/ 20 1/ 5 × 0,1 2/ 1; 2	*R* ∞ $Ø_e$ 29 Protective chamfer 0,4 – 0,6 Ⓛ AR 209.1060 3/ 5(1) 4/ — 5/ 5 × 0,1; C 5 × 0,16; L 3 × 0,004; E 0,4 6/ 6 KWcm^{-2}; 1 060 nm; 10
Indications in accordance with ISO 10110	Lens 114.379	

Figure 2 — Example of tabular indication of data for a lens element



Left surface	Material specification	Right surface
R 60,43 CC $Ø_e$ 35 Protective chamfer 0,2 – 0,4 Ⓛ AR 207b 3/ 2(0,5) 4/ — 5/ 5 × 0,16; L 2 × 0,04; E 0,5	BK7 n_e 1,518 72 ± 0,001 v_e 63,96 ± 0,8 % 0/ 10 1/ 5 × 0,16 2/ 1; 2	*R* 50,17 CX $Ø_e$ 34 Protective chamfer 0,2 – 0,4 Ⓛ — 3/ 3(1) 4/ 2' 5/ 5 × 0,16; L 2 × 0,04; E 0,5 To be cemented
Indications in accordance with ISO 10110	Lens 124.736	

Figure 3 — Example of tabular indication of data for a lens element