



BSI Standards Publication

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

Part 1: General

National foreword

This British Standard is the UK implementation of ISO 10110-1:2019. It supersedes BS ISO 10110-10:2004 and BS ISO 10110-1:2006, which are withdrawn.

The UK participation in its preparation was entrusted to Technical Committee CPW/172, Optics and Photonics.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

© The British Standards Institution 2019
Published by BSI Standards Limited 2019

ISBN 978 0 580 94985 2

ICS 01.100.20; 37.020

Compliance with a British Standard cannot confer immunity from legal obligations.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 31 October 2019.

Amendments/corrigenda issued since publication

Date	Text affected
------	---------------

INTERNATIONAL
STANDARD

ISO
10110-1

Third edition
2019-10-07

**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



Reference number
ISO 10110-1:2019(E)



COPYRIGHT PROTECTED DOCUMENT

© ISO 2019, Published in Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

Contents

	Page
Foreword	iv
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Fundamental stipulations	2
5 Presentation and dimensioning	3
5.1 Drawing format.....	3
5.1.1 General.....	3
5.1.2 Drawing field.....	3
5.1.3 Table field.....	3
5.1.4 Title field.....	5
5.1.5 Alternative drawing layout.....	5
5.1.6 Examples.....	5
5.2 Views.....	6
5.3 Global and Local Coordinate Systems.....	8
5.4 Axes.....	9
5.5 Leader lines.....	10
5.6 Test regions.....	10
5.7 Test fields.....	11
5.8 Test volumes.....	11
5.9 Dimensioning.....	13
5.9.1 General.....	13
5.9.2 Radius of curvature.....	13
5.9.3 Thickness.....	14
5.9.4 Diameter.....	15
5.9.5 Presentation of shapes of edges, bevels and chamfers.....	15
5.9.6 Linear dimensions.....	17
5.9.7 Angles.....	18
5.9.8 Special surfaces.....	19
5.10 Material specification.....	20
5.10.1 General.....	20
5.10.2 Crystallographic axes.....	20
5.11 Indication of optical tolerances and various properties.....	20
5.11.1 Tolerances for the position of the local coordinate systems.....	20
5.11.2 Optical properties and tolerances.....	20
5.11.3 Optical subassembly.....	22
6 Additional indications for optical layout drawings	22
6.1 General.....	22
6.2 Axial separations.....	25
6.2.1 General.....	25
6.2.2 Fixed axial separations.....	25
6.2.3 Adjustable axial separations.....	25
6.2.4 Variable axial separations.....	26
6.3 Images, pupils, field stops and other apertures.....	26
Annex A (informative) Examples of drawings of optical elements	28
Bibliography	45

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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

The committee responsible for this document is ISO/TC 172, *Optics and photonics*, Subcommittee SC 1, *Fundamental standards*.

This third edition cancels and replaces ISO 10110-1:2006 and ISO 10110-10:2004, which have been technically revised and merged into one single document.

The main changes compared to the previous edition are as follows:

- a) Drawing scale and the reference wavelength are required to be included on the drawing;
- b) provisions have been added to allow coordinate systems to be defined for each surface and for the part as a whole;
- c) new tabular formats have been added to allow more surfaces on a tabular drawing, partially tabulated drawings, and new types of assembly drawings;
- d) a new notation for special surfaces has been added;
- e) in addition, many more examples of drawings and notations have been provided;
- f) and various detailed notes have been added, and corrections and modifications have been made for improved clarity;
- g) GSP defaults by definition no longer apply, they have to be specifically invoked.

A list of all parts in the ISO 10110 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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

Part 1: General

1 Scope

This document specifies the general layout of drawings and provides examples of indications in the ISO 10110 series, which standardizes drawing indications for optical elements and systems.

This document specifies the presentation in drawings of the characteristics, including the tolerances, of optical elements and systems. This document also includes the popular tabular format, formerly presented in ISO 10110-10. This tabular format, now described in [5.1](#), is the preferred format for ISO 10110 drawings.

Rules for preparation of technical drawings as well as for dimensioning and tolerancing are given in various ISO 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 documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 10110-6, *Optics and photonics — Preparation of drawings for optical elements and systems — Part 6: Centring tolerances*

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

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

ISO 10110-18, *Optics and photonics — Preparation of drawings for optical elements and systems — Part 18: Stress birefringence, bubbles and inclusions, homogeneity, and striae*

ISO 10110-19, *Optics and photonics — Preparation of drawings for optical elements and systems — Part 19: General description of surfaces and components*

ISO 12123, *Optics and photonics — Specification of raw optical glass*

ISO 80000-1, *Quantities and units — Part 1: General*

3 Terms and definitions

No terms and definitions are listed in this document.