

ANSI/OEOSC OP1.0110-9:2015 (ISO 10110-9:1996 MOD)

American National Standard

for Optics and Electro-Optical Instruments –
Preparation of drawings for optical elements and systems–
Part 9: Surface treatment and coating

Secretariat
Optics and Electro-Optics Standards Council

Approved 2015
American National Standards Institute, Inc.



ANSI/OEOSC OP1.0110-9:2015 (ISO 10110-9:1996 MOD)

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Foreword to the American National Standard edition

This national standard establishes uniform practices for indicating the treatments and coatings applied to optical surfaces for functional and/or protective purposes. It is based entirely on the international standard ISO 10110-9:1996.

In its implementation as a national standard, however, some accommodation must be made for standard practice in the United States. This requires the following modification in interpretation.

The normative reference for ISO 7944 should be considered informative. Since the use wavelength is a central part of a coating specification, it should always be indicated, either in the coating specification or as a note on the drawing indicating the wavelength, for example "Reference wavelength $\lambda = 632.8 \text{ nm}$."

As with other parts of ISO 10110, there are several references to other parts of ISO 10110 for which there is an analogous American National Standard. The following table shows the OP equivalent standards for the parts of ISO 10110. Where possible, it is recommended that the OP standards be used. As of this writing, not all of the OP standards are available, and suitable equivalent ISO standards should be employed.

ISO Standard	OP Equivalent	Subject
ISO 10110-1	OP 1.0110-1	Drawing notation, general
ISO 10110-2 thru 4	OP 3.001	Glass tolerances
ISO 10110-5 and ISO10110-14	OP 1.0110-5 OP 1.0110-14	Surface wavefront, transmitted wavefront
ISO 10110-6	OP 1.0110-6	Centering
ISO 10110-7	OP 1.002	Surface imperfections
ISO 10110-8	OP 1.0110-8	Surface texture
ISO 10110-9	OP 1.0110-9	Coatings
ISO 10110-10	OP 1.0110-10	Tabular notation
ISO 10110-11	OP 1.0110-11	Non-toleranced Data
ISO 10110-12	OP 1.0110-12	Aspheric surfaces
ISO 10110-17	Under review	Laser Damage

In the interests of facilitating the use of this standard, the original text of ISO 10110-9 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.

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This standard was processed and approved for submittal to ANSI by the OEOSC Committee on Optics and Electro-Optical Instruments, ASC 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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AMERICAN
NATIONAL
STANDARD

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OP1.0110-9
(ISO 10110-9 MOD)

ISO First edition
1996-03-15

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

Part 9:
Surface treatment and coating



Reference number
ISO 10110-9:1996(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.

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 10110-9 was prepared by Technical Committee ISO/TC 172, *Optics and photonics*, Subcommittee SC 1, *Fundamental standards*.

ANS Note 1: The name of ISO TC/172 has changed to Optics and photonics. The titles of standards prepared by ISO/TC 172 are being updated as they are revised or confirmed.

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 a lens element*
- *Part 11: Non-toleranced data*
- *Part 12: Aspheric surfaces*
- *Part 13: Laser irradiation damage threshold*

ANS Note 2: The *Laser irradiation damage threshold* part has been redesignated *Part 17*.

Annex A of this part of ISO 10110 is for information only.

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

Part 9: Surface treatment and coating

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 rules for indicating the treatments and coatings applied to optical surfaces for functional and/or protective purposes.

2 Definitions

For the purposes of this part of ISO 10110, the following definitions apply.

2.1 functional coating:

Thin film deposited to affect surface reflectance, to separate spectral wavelength regions, and/or to produce certain polarization or other special properties.

NOTE 1 The common types of functional coating are reflective, antireflective, wavelength selective and conductive coatings.

Detailed information on coatings is contained in ISO 9211-1 to ISO 9211-4.

ANS Note 3: ISO 9211-1 Table 1 gives definitions for 10 types of functional coatings.

2.2 protective surface treatment:

Paint or plating protection applied to optical surfaces, particularly rear surface mirrors, to prevent damage from handling, environmental effects and other causes.

NOTE 2 Surfaces may also be painted or covered in certain areas to limit their optically effective apertures for stray light control.

3 General

ISO 10110-1 stipulates that all indications apply fundamentally to the finished product. Accordingly, the dimensions given in drawings which mention surface treatments or coatings, refer to the dimensions after application of the treatments or coatings (see figure 5). However, in certain cases, the dimensions of a part before the application of surface treatments may be important. In such cases it shall be explicitly indicated in the drawing that these dimensions refer to the untreated part.

4 Indication in drawings

Since coating performance requirements are usually complex, they are described in separate specification documents, which shall be referenced in the drawings.