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Optics and photonics — Optical coatings —

Part 6: Minimum requirements for reflecting coatings

Optique et photonique — Traitements optiques —

Partie 6: Exigences minimales pour revêtements réfléchissants

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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).

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For an explanation of 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.

This document was prepared by ISO/TC 172, *Optics and photonics*, Subcommittee SC 3, *Optical materials and components*.

A list of all parts in the ISO 9211 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.

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Optics and photonics — Optical coatings —

Part 6:
Minimum requirements for reflecting coatings

1 Scope

This document specifies minimum requirements on the optical effects and the mechanical, chemical and environmental properties of reflecting metal coatings. This document applies to reflecting metal coatings based on aluminium or silver for optical applications. Thereby the user is able to rely on defined numerical data while the manufacturer of thin films has the choice for the materials and production method.

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 9211-1, *Optics and photonics — Optical coatings — Part 1: Vocabulary*

ISO 9211-4, *Optics and photonics — Optical coatings — Part 4: Specific test methods*

ISO 10110-7, *Optics and photonics — Preparation of drawings for optical elements and systems — Part 7: Surface imperfections*

ISO 10110-8, *Optics and photonics — Preparation of drawings for optical elements and systems — Part 8: Surface texture; roughness and waviness*

ISO 10110-9, *Optics and photonics — Preparation of drawings for optical elements and systems — Part 9: Surface treatment and coating*

ISO 13696, *Optics and optical instruments — Test methods for radiation scattered by optical components*

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3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 9211-1 and the following apply.
ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

3.1
reflecting coating
mirror coating
coating which shows high reflectance in a defined spectral region

3.2
front surface mirror coating
coating which reflects the optical radiation away from the substrate

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3.3
rear surface mirror coating
R
coating which reflects the optical radiation towards the substrate

3.4
Al
metallic coating made of aluminium

3.5
Ag
metallic coating made of silver

3.6
GS
protective coating between incident medium and the *reflecting coating* (3.1)

3.7
RI
dielectric coating that increases the reflecting function

4 Designation

Designation of a front surface mirror of aluminium (Al) with a protecting layer (GS) and the wavelength limits $\lambda_1 = 400\,\text{nm}$ and $\lambda_2 = 680\,\text{nm}$:

RE coating ISO 9211-6 – Al – GS – 400 – 680

The following abbreviations shall be applied:

Al Aluminium, front surface mirror coating, unprotected

Al – GS Aluminium, front surface mirror coating, protected

Al – RI Aluminium, front surface mirror coating, with reflection increasing interference coating

Ag – R Silver, rear surface mirror coating

5 Indication in drawings

When applying this standard (λ) (the symbol for optical coating in accordance with ISO 10110-9) shall be indicated in the drawing in conjunction with the designation in accordance with Clause 4.

6 Materials and layout

The front and rear facing mirrors have different materials and layout (see Table 1).

Table 1 — Materials and layout

Mirror coating	Material	Layout	Code
Front surface mirror coating	Aluminium	Without protection layer	Al
		With protection layer	Al – GS
		With reflection increasing interference coating	Al – RI
Rear surface mirror coating	Silver	—	Ag – R

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