



**ISO 9211-1**

**Optics and photonics — Optical coatings —**

**Part 1:  
Vocabulary**

*Optique et photonique — Traitements optiques —  
Partie 1: Vocabulaire*

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<b>Foreword</b> .....	<b>iv</b>
<b>Introduction</b> .....	<b>v</b>
<b>1 Scope</b> .....	<b>1</b>
<b>2 Normative references</b> .....	<b>1</b>
<b>3 Terms and definitions</b> .....	<b>1</b>
3.1 Basic terms and definitions.....	1
3.1.1 General terms.....	1
3.1.2 Terms for optical properties of a coated surface.....	2
3.1.3 Terms for polarization.....	4
3.1.4 Phase related terms.....	5
3.2 Designations of coatings by principal function.....	6
3.2.1 Reflecting function.....	6
3.2.2 Antireflecting function.....	6
3.2.3 Beam splitting function.....	6
3.2.4 Attenuating function.....	7
3.2.5 Bandpass or band rejection filtering function.....	7
3.2.6 Selecting or combining function.....	7
3.2.7 Polarizing function.....	7
3.2.8 Phase changing function.....	7
3.2.9 Absorbing function.....	8
3.2.10 Supplementary function.....	8
3.3 Terms related to common coating imperfections.....	9
3.3.1 Point-like imperfections.....	9
3.3.2 Line-like imperfections.....	9
3.3.3 Area-like imperfections.....	10
3.3.4 Volume-like imperfections.....	10
<b>Annex A (informative) Micrographs of common types of coating imperfections</b> .....	<b>11</b>
<b>Bibliography</b> .....	<b>20</b>

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This fourth edition cancels and replaces the third edition (ISO 9211-1:2018), which has been technically revised.

The main changes are as follows:

- addition of the definition of spectral optical density;
- explanations of subscript for spectral average;
- explanations of average transmittance, reflectance, absorptance and optical density over wavelength or wave number.

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The optical properties of a coated surface are characterized by spectrophotometric values. These values relate to the energy transported by electromagnetic waves (radiant or luminous) and they vary as a function of the wavelength, the angle of incidence, and the state of polarization. Additional influences can be caused by scattering.

NOTE 1 The functional spectral dependency is generally indicated by including the wavelength ( $\lambda$ ) in parentheses as part of the symbol.

NOTE 2 The wavelength ( $\lambda$ ) can be replaced by the wavenumber ( $\sigma$ ) or the photon energy ( $h\nu$ ).  $h$  = Planck constant;  $\nu$  = frequency. The units recommended are the nanometre (nm) or the micrometre ( $\mu\text{m}$ ) for the wavelength, the reciprocal centimetre ( $\text{cm}^{-1}$ ) for the wavenumber and the electron volt (eV) for the photon energy.

When a coating is used at an angle of incidence different from zero, its characteristics depend upon the state of polarization of the incident radiation and it can influence the polarization state of the emergent radiation. It might then be necessary to indicate the orientation of the electric field vector in relation to the plane of incidence.

The coatings are defined according to their function, i.e. according to the nature of the principal modification to the surface properties that they realize. A coating intended to realize a principal function as defined in [Table 1](#) can also include one or more secondary functions. Their relative importance with regard to the principal function may be indicated.

A surface for visual applications can be characterized by colorimetric parameters. These depend on the reference illumination source, the reference observer, and the optical properties of the surface. Colorimetric parameters are not part of this standard.

Examples of coating imperfections are given in [Annex A](#). Test methods for the surface imperfections are described in ISO 14997.