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BSI Standards Publication

Optics and photonics — Optical coatings

Part 3: Environmental durability

bsi.

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National foreword

This British Standard is the UK implementation of ISO 9211-3:2024. It supersedes BS ISO 9211-3:2008, which is withdrawn.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 committee manager.

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Part 3: Environmental durability

Optique et photonique — Traitements optiques —

Partie 3: Durabilité environnementale

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This document was prepared by Technical Committee *[or Project Committee]* ISO/TC 172, *Optics and photonics*, Subcommittee SC 3, *Optical materials and components*.

This third edition cancels and replaces the second edition (ISO 9211-3:2008), which has been technically revised.

The main changes are as follows:

— Included ISO 9211-2 in bibliography.

— Add new section that explains the test code notation to use when specifying a coating environmental durability test.

— Remove previous Annex A and move test sequence tables for standard categories into relevant sections.

— Update notation for standard test sequence tables to include conditioning method and degree of severity test code notation.

— Clarify that category O is for non-standard test sequences that are also similar to other standard categories of use.

— Add new section for a general use case when specifying coating environmental durability tests and the sequence they follow. This is used for test sequences that are not similar to any of the standard categories of use.

— Add statement that if specifying a temperature requirement for a coating, this notation is described in ISO 9211-2.

— Add new Annex A that includes the previously shown Table 1.

— Update previous Table 1 to include conditioning method and degrees of severity test code notation.

— Add new relevant degrees of severity from ISO 9022-2/Amd.1 and ISO 9022-4/Amd.1.

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— Clarify descriptions in previous Table 1 to match what is listed in the conditioning method table for each test.

— Separate solvent solubility line in previous Tables A.2, A.3 and A.4 to two lines, separating acetone and ethanol.

— Add new Annex B explaining how to use category 0.

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 3: Environmental durability

1 Scope

ISO 9211 (series) describes surface treatments of components and substrates excluding ophthalmic optics (spectacles) by the application of optical coatings and gives a standard form for their specification. It defines the general characteristics and the test and measurement methods whenever necessary, but it is not intended to define the process method.

This document specifies general use and standard categories of use for optical coatings and identifies which environmental tests are necessary to prove that the coatings meet the required specification. The mechanical and chemical properties of coated optical elements, and more generally their environmental durability, can be assessed by a variety of methods. The test methods are generally described in various parts of ISO 9022 and in ISO 9211-4. These test methods are selected to give meaningful results representative of actual exposure of optical elements in their operating environment, alternatively to the minimum requirements as described in ISO 9211-5 to ISO 9211-8, which are coating type related.

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 9022-1, *Optics and photonics — Environmental test methods — Part 1: Definitions, extent of testing*

ISO 9022-2, *Optics and photonics — Environmental test methods — Part 2: Cold, heat and humidity*

ISO 9022-4, *Optics and photonics — Environmental test methods — Part 4: Salt mist*

ISO 9022-6, *Optics and photonics — Environmental test methods — Part 6: Dust*

ISO 9022-9, *Optics and photonics — Environmental test methods — Part 9: Solar radiation and weathering*

ISO 9022-11, *Optics and photonics — Environmental test methods — Part 11: Mould growth*

ISO 9022-12, *Optics and photonics — Environmental test methods — Part 12: Contamination*

ISO 9022-14, *Optics and photonics — Environmental test methods — Part 14: Dew, hoarfrost, ice*

ISO 9211-4, *Optics and optical instruments — Optical coatings — Part 4: Specific test methods: abrasion, adhesion and resistance to water*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

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

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