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

Part 7: Surface imperfections

*Optique et photonique — Indications sur les dessins pour éléments et
systèmes optiques —*

Partie 7: Imperfections de surface



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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).

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

This third edition cancels and replaces the second edition (ISO 10110-7:2008), which has been technically revised.

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

- an additional notation has been added which allows the specification of a maximum allowable width for imperfections;
- long imperfection accumulation rules have been corrected to coincide with the Renard series of grades;
- the rules for determining concentrations have been clarified;
- the test method notations and meanings have been clarified;
- an additional notation has been added which allows the use of the popular scratch and dig specification for cosmetic surface imperfections;
- in addition, several changes have been made to bring this document into alignment with the inspection methods for surface imperfections which are described in ISO 14997, and various editorial corrections have been made throughout this document.

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

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Introduction

A localized surface imperfection, such as a dig or a scratch resulting from handling or manufacture, can degrade the perceived quality of an optical component. In some cases, surface imperfections are specified according to their visibility, and in other cases, according to their size.

Visual dark field inspection reveals the location of very small imperfections. The use of a brightness comparison standard, together with tolerance levels agreed upon by the manufacturer and user, permits classification of an imperfection as acceptable or unacceptable. This form of subjective inspection based on visibility or a visual assessment of brightness or apparent size, although economical and fast, lacks precision.

In cases where the size, and not the brightness, is important, surface imperfections are specified according to their affected area (dimensional assessment). In this case, visual assessment using a dimensional comparison standard is still possible, but lacks the precision required for some applications. Measurement is only required as a second stage operation following a visual inspection to determine location and to select a surface imperfection worthy of study. In such cases, a drawing notation indicating this level of inspection is required and can be added to the specification.