

PD ISO/TR 14880-5:2010



BSI Standards Publication

Optics and photonics — Microlens arrays

Part 5: Guidance on testing

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National foreword

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. 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.

In exceptional circumstances, when a technical committee has collected data of a different kind from that which is normally published as an International Standard ("state of the art", for example), it may decide by a simple majority vote of its participating members to publish a Technical Report. A Technical Report is entirely informative in nature and does not have to be reviewed until the data it provides are considered to be no longer valid or useful.

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.

ISO/TR 14880-5 was prepared by Technical Committee ISO/TC 172, *Optics and photonics*, Subcommittee SC 9, *Electro-optical systems*.

ISO 14880 consists of the following parts, under the general title *Optics and photonics — Microlens arrays*:

- *Part 1: Vocabulary*
- *Part 2: Test methods for wavefront aberrations*
- *Part 3: Test methods for optical properties other than wavefront aberrations*
- *Part 4: Test methods for geometrical properties*
- *Part 5: Guidance on testing* [Technical Report]

Introduction

This part of ISO 14880 is intended as a guide to the selection and use of the appropriate method for testing optical and geometrical properties of a single microlens or microlens arrays. Examples of applications for microlens arrays include three-dimensional displays, coupling optics associated with arrayed light sources and photo-detectors, enhanced optics for liquid crystal displays, and optical parallel processor elements.

The testing of microlenses is in principle no different to testing any other lens. The same parameters need to be measured and the same techniques used. However, in many cases the measurement of very small lenses presents practical problems which make it difficult to use the standard equipment that is available for testing normal-size lenses.

The growing market in microlens arrays has generated a need for agreement on basic terminology and test methods. Standard terminology and clear definitions are needed not only to promote applications but also to encourage scientists and engineers to exchange ideas and new concepts based on common understanding.

The purpose of ISO 14880 is to improve the compatibility and interchange ability of lens arrays from different suppliers and to enhance development of the technology that uses microlens arrays. The various parts of ISO 14880 define terms and describe methods for testing wavefront aberrations, optical properties other than wavefront aberrations, and test methods for geometrical properties. This part of ISO 14880 contributes to the purpose by guiding the user to select the appropriate part of ISO 14880 for testing microlens properties, however the user is not limited to these techniques.

Optics and photonics — Microlens arrays —

Part 5: Guidance on testing

1 Scope

This part of ISO 14880 gives guidelines for the testing of microlenses. It applies to microlenses in arrays where very small lenses are formed inside or on one or more surfaces of a common substrate.

This part of ISO 14880 addresses the measurement of optical and geometrical properties of single microlenses as well as microlens arrays.

When testing a microlens or microlens array, the test method is selected according to the parameters to be measured, the size and structure of the microlens and its application. This part of ISO 14880 guides the user to select the appropriate measurement method from the available ISO standards.

2 Normative references

The following referenced documents are indispensable for the application 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 14880-1, *Optics and photonics — Microlens arrays — Part 1: Vocabulary*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 14880-1 apply.

4 Symbols and units

Symbols and units of measurement that are used in this part of ISO 14880 are given in Table 1.