



NSAI
Standards

Irish Standard
I.S. EN ISO 14880-1:2016

Optics and photonics - Microlens arrays - Part 1: Vocabulary and general properties (ISO 14880-1:2016)

I.S. EN ISO 14880-1:2016

Incorporating amendments/corrigenda/National Annexes issued since publication:

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National Foreword

I.S. EN ISO 14880-1:2016 is the adopted Irish version of the European Document EN ISO 14880-1:2016, Optics and photonics - Microlens arrays - Part 1: Vocabulary and general properties (ISO 14880-1:2016)

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EUROPEAN STANDARD

EN ISO 14880-1

NORME EUROPÉENNE

EUROPÄISCHE NORM

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Supersedes EN ISO 14880-1:2005

English Version

Optics and photonics - Microlens arrays - Part 1: Vocabulary and general properties (ISO 14880-1:2016)

Optique et photonique - Réseaux de microlentilles -
Partie 1: Vocabulaire et propriétés générales (ISO
14880-1:2016)

Optik und Photonik - Mikrolinsenarrays - Teil 1:
Begriffe und allgemeine Eigenschaften (ISO 14880-
1:2016)

This European Standard was approved by CEN on 22 July 2016.

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EN ISO 14880-1:2016 (E)

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European foreword

The text of ISO 14880-1:2016 has been prepared by Technical Committee ISO/TC 172 “Optics and photonics” of the International Organization for Standardization (ISO) and has been taken over as EN ISO 14880-1:2016 by Technical Committee CEN/TC 123 “Lasers and photonics” the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by February 2017, and conflicting national standards shall be withdrawn at the latest by February 2017.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

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Endorsement notice

The text of ISO 14880-1:2016 has been approved by CEN as EN ISO 14880-1:2016 without any modification.

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**INTERNATIONAL
STANDARD**

**ISO
14880-1**

Second edition
2016-04-01

**Optics and photonics — Microlens
arrays —**

**Part 1:
Vocabulary and general properties**

Optique et photonique — Réseaux de microlentilles —

Partie 1: Vocabulaire et propriétés générales



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ISO 14880-1:2016(E)

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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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: [Foreword - Supplementary information](#)

The committee responsible for this document is ISO/TC 172, *Optics and photonics*, Subcommittee SC 9, *Electro-optical systems*.

This second edition cancels and replaces the first edition (ISO 14880-1:2001), which has been technically revised. It also incorporates the Technical Corrigenda ISO 14880-1:2001/Cor 1:2003 and ISO 14880-1:2001/Cor 2:2005.

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

- *Part 1: Vocabulary and general properties*
- *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*

Introduction

The aim of this part of ISO 14880 is to clarify the terms used in the field of microlens arrays.

Microoptics and microlens arrays are found in many modern optical devices.^[1] They are used as coupling optics for detector arrays, the digital camera being an example of a mass market application. They are used to enhance the optical performance of liquid crystal displays to couple arrays of light sources and to direct illumination for example in 2D and 3D television, mobile phone and portable computer displays. Microlens arrays are used in wavefront sensors for optical metrology and astronomy, lightfield sensors for three-dimensional photography and microscopy and in optical parallel processor elements.

Multiple arrays of microlenses can be assembled to form optical systems such as optical condensers, controlled diffusers and superlenses.^{[2][3]} Furthermore, arrays of microoptical elements such as micro-prisms and micro-mirrors are used.^{[4][5]}

The expanded market in microlens arrays has generated a need to agree on basic terms and definitions for microlens arrays and systems and this part of ISO 14880 aims to satisfy that need.

Optics and photonics — Microlens arrays —

Part 1: Vocabulary and general properties

1 Scope

This part of ISO 14880 defines terms for microlens arrays. It applies to microlens arrays which consist of arrays of very small lenses formed inside or on one or more surfaces of a common substrate and systems. The aim of this part of ISO 14880 is to improve the compatibility and interchangeability of lens arrays from different suppliers and to enhance the development of technology using microlens arrays.

2 Terms and definitions

2.1 Basic definition of microlens and microlens array

2.1.1

microlens

lens in an array with an aperture of less than a few millimetres including lenses which work by refraction at the surface, refraction in the bulk of the substrate, diffraction or a combination of these

Note 1 to entry: The microlens can have a variety of aperture shapes: circular, hexagonal or rectangular for example. The surface of the lens can be flat, convex or concave.

2.1.2

microlens array

regular arrangement of microlenses on a single substrate

Note 1 to entry: Irregular or structured arrays are sometimes used, for example, in beam shaping, diffusion, and homogenization.

2.2 General terms and definitions

2.2.1

effective front focal length

$f_{E,f}$

distance from the vertex of the microlens to the position of the focus given by finding the maximum of the power density distribution when collimated radiation is incident from the back of the substrate

Note 1 to entry: The effective front focal length can differ from the paraxial front focal length in the case of aberrated lenses.

Note 2 to entry: The effective front focal length is different from the classical effective focal length since it is measured from the lens vertex.

2.2.2

effective back focal length

$f_{E,b}$

distance from the back surface of the substrate or the vertex of the microlens to the position of the focal point, when collimated radiation is incident from the lens side of the substrate

Note 1 to entry: The effective back focal length can differ from the paraxial back focal length in the case of aberrated lenses.

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