INTERNATIONAL STANDARD

ISO 14881

Second edition
2021-10

Integrated optics — Interfaces — Parameters relevant to coupling properties

Optique intégrée — Interfaces — Paramètres caractérisant les propriétés de couplage

Reference number
ISO 14881:2021(E)

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Published in Switzerland

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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 9, *Laser and electro optical systems.* In collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 123, *Lasers and photonics* , in accordance with the agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This second edition cancels and replaces the first edition (ISO 14881:2001), which has been technically revised. The main changes compared to the previous edition are as follows:

— Terminologies that have not been frequently used over the last 5 to 10 years are revised to those matching to current trends.

— In the revision process, terminologies and definitions are compared to similar terminology definitions in IEC and harmonized.

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.

Introduction

The aim of this document is to clarify the terms of the field of "integrated optics" and to define a unified vocabulary. It is expected that this document will be revised periodically to adopt the requirements of customers and suppliers of integrated optical products. At a later stage, it is planned to add definitions from other International Standards which deal with integrated optics.

Some of the definitions are closely related to definitions given in IEC 60050-731. Wherever this can lead to misunderstanding, integrated optics or integrated optical waveguide should be used together with the defined term.

Integrated optics — Interfaces — Parameters relevant to coupling properties

1 Scope

This document defines the relevant properties for coupling lightwaves into and out of integrated optical chips (IOC) and chips with photonic integrated circuits (PIC). This document mainly focuses on butt coupling via the waveguide endfaces. The definitions provide the basis for specifying the elements to be coupled (e. g. fibres, integrated optical chips) related to coupling properties.

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 4288, *Geometrical Product Specifications (GPS) — Surface texture: Profile method — Rules and procedures for the assessment of surface texture*

ISO 11807-1:2021, *Integrated optics — Vocabulary — Part 1: Basic terms and symbols*

ISO 11807-2, *Integrated optics — Vocabulary — Part 2: Terms used in classification*

IEC 60793-1-20, *Optical fibres — Part 1-20: Measurement methods and test procedures — Fibre geometry*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 11807-1 and ISO 11807-2 and the following apply.

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

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

— IEC Electropedia: available at https://www.electropedia.org/

Note 1 to entry A list of relevant terms and symbols can be found in Annex A.

3.1
adiabatic coupling
coupling of fibre and tapered waveguide or two waveguides one of which, at least is tapered to utilize mode coupling without optical power loss for maximum *coupling efficiency* (3.9)

3.2
anti-reflective coating of endfaces
thin film coating on the endfaces of optical chips designed to reduce the *Fresnel loss* (3.15)

3.3
array block
mechanical alignment structure of micrometre or submicrometre precision for the reception of optical fibres adopted in *single-fibre coupling* (3.21) and *fibre array coupling* (3.12)

Note 1 to entry: The alignment structures, which are generally arranged in a regular pattern, determine the position of the fibres with respect to each other. These positions are defined by the fibre's cladding diameter and the geometry of the alignment structures.