SLOVENSKI STANDARD
oSIST prEN ISO 14881:2020

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Integrirana optika - Vmesniki - Parametri, ustrezni za sklope lastnosti (ISO/DIS 14881:2020)

Integrated optics - Interfaces - Parameters relevant to coupling properties (ISO/DIS 14881:2020)

Integrierte Optik - Schnittstellen - Kopplungsrelevante Parameter (ISO/DIS 14881:2020)

Optique intégrée - Interfaces - Paramètres caractérisant les propriétés de couplage (ISO/DIS 14881:2020)

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Integrated optics — Interfaces — Parameters relevant to coupling properties

Optique intégrée — Interfaces — Paramètres caractérisant les propriétés de couplage

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Contents

Page

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 voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 172 *Optics and photonics*, Subcommittee SC 9, *Laser and electro optical systems.*

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 relatively new field of “integrated optics” and to define a unified vocabulary at a time when the first products are coming onto the market. 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, *International electrotechnical vocabulary*. 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 light 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 4288:1996, *Geometrical Product Specifications (GPS) — Surface texture: Profile method — Rules and procedures for the assessment of surface texture*

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

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

IEC 60793-1-20:2014, *Optical fibres — Part 1-20: Measurement methods and test procedures — Fibre geometry*

3 Terms and definitions

For the purposes of this International Standard, 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:

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

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

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

3.2
anti-reflection coating of endfaces
thin film coating on the endfaces of chips and waveguides designed to reduce the Fresnel loss

3.3
array block
mechanical alignment structure of micrometre or submicrometre precision for the reception of optical fibres

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.

Note 2 to entry: An array block may have additional guiding structures for the alignment of the array with an integrated optical chip (see e. g. V-groove array).

3.4
butt coupling
coupling of waveguide and fibre, two waveguides, or two fibres with their endfaces in contact or nearly in contact

3.5
chip edge
edge formed by the surface of chip perimeter

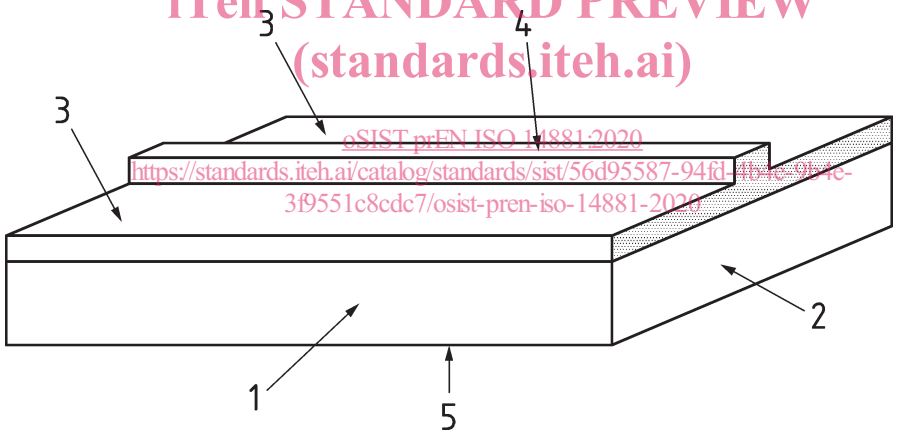
Note 1 to entry: see Figure 1.

3.6
chip endface
optical facet
chip-limiting plane, which contains the optical interface(s)

Note 1 to entry: see Figure 1.

3.7
chip surface
plane on the top or bottom of the chip parallel to the plane of the waveguide(s)

Note 1 to entry: see Figure 1.



Key

1	chip edge	4	chip surface (top)/optical facet
2	chip endface / optical facet	5	chip surface (bottom)
3	chip surface (top)		

Figure 1 — Integrated optical chip structure

3.8
coupling efficiency
η
ratio of the optical power coupled into the endface of an optical element *j* (e. g. fibre core or chip endface) to the emitted optical power at the output endface of the element *i*

$$\eta = P_{m,j} / P_{l,i}$$

where