

BS EN 62496-4:2011



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Optical circuit boards

Part 4: Interface standards —
General and guidance

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National foreword

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The UK participation in its preparation was entrusted to Technical Committee GEL/86, Fibre optics.

A list of organizations represented on this committee can be obtained on request to its secretary.

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EUROPEAN STANDARD
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EUROPÄISCHE NORM

EN 62496-4

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English version

**Optical circuit boards -
Part 4: Interface standards -
General and guidance
(IEC 62496-4:2011)**

Cartes à circuits optiques -
Partie 4: Normes d'interface -
Généralités et lignes directrices
(CEI 62496-4:2011)

Optische Leiterplatten -
Teil 4: Schnittstellennormen -
Allgemeines und Leitfaden
(IEC 62496-4:2011)

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European Committee for Electrotechnical Standardization
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Foreword

The text of document 86/379/FDIS, future edition 1 of IEC 62496-4, prepared by IEC TC 86, Fibre optics, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 62496-4 on 2011-03-02.

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The following dates were fixed:

- latest date by which the EN has to be implemented
at national level by publication of an identical
national standard or by endorsement (dop) 2011-12-02
- latest date by which the national standards conflicting
with the EN have to be withdrawn (dow) 2014-03-02

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 62496-4:2011 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 60027 series	NOTE	Harmonized in EN 60027 series (not modified).
IEC 60695-11-5	NOTE	Harmonized as EN 60695-11-5.
IEC 60825-1	NOTE	Harmonized as EN 60825-1.
IEC 60825-2	NOTE	Harmonized as EN 60825-2.
IEC 61300 series	NOTE	Harmonized in EN 61300 series (not modified).
ISO 286-1	NOTE	Harmonized as EN ISO 286-1.
ISO 1101	NOTE	Harmonized as EN ISO 1101.
ISO 7083	NOTE	Harmonized as EN ISO 7083.

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

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.

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60793-1-45 (mod)	-	Optical fibres - Part 1-45: Measurement methods and test procedures - Mode field diameter	EN 60793-1-45	-

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OPTICAL CIRCUIT BOARDS –

Part 4: Interface standards – General and guidance

1 Scope

This part of IEC 62496 covers general information on the subject of Optical Circuit Board (OCB) interfaces. It includes normative references, definitions and rules for creating and interpreting the standard drawings.

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.

IEC 60793-1-45, *Optical fibres – Part 1-45: Measurement methods and test procedures – Mode field diameter*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1 General definitions

3.1.1

OCB interface

sizes and relative locations for the features comprising the OCB. It also includes the location of the coordinates of the alignment mark

3.1.2

OCB body

portion of an OCB where optical fibres/waveguides are fixed/fabricated to form an optical routing pattern. The typical shape of an OCB body is rectangular

3.1.3

shape of the OCB body

outline of the OCB body which consists of a straight line and a curved line

NOTE The straight line is defined by coordinates of start point and end point, and the curved line is defined by the coordinates of the start and the end points of the curve and by radius of curvature.

3.1.4

OCB tail

(OCB leg)

projection from the OCB body for interconnection with optical fibre cables and/or optical components

3.1.5

length of the OCB tail

distance between the edge of an OCB body and the end of the OCB tail protruding from the edge of the OCB body

NOTE If the OCB tail has a mark in the vicinity of its end, the OCB tail length is the distance between the mark and the end of the OCB body.

3.1.6

OCB port

position on the edge of the OCB body where OCB tails protrude from the OCB body

NOTE Relative positional accuracy between the OCB port and alignment mark or origin point is important for connection with other boards or devices. The OCB port is defined only for the fibre flexible OCB.

3.1.7

position of the OCB port

coordinates at the intersectional point of the central axis of the optical fibre and the edge of the OCB body

NOTE The coordinates of the OCB port consisting of closely arrayed fibres shall be defined by the coordinates of the OCB port closest to the origin point.

EXAMPLE In a case where the OCB body of the fibre flexible OCB is put in the first quadrant and an outline or an angle of the OCB is in contact with the X-axis or the Y-axis, as shown in Figure B.2 of Annex B, the coordinates of origin are defined as the origin point of the fibre flexible OCB. It is recommended to set one side of the OCB body parallel to the X-axis or the Y-axis. In another case where the alignment mark for assembly of optical components on the OCB is located near the I/O ports, the centre of the alignment mark is defined as the origin point of the OCB.

3.1.8

I/O port

window in the OCB through which optical energy enters and/or exits

NOTE The I/O port is located at the end of the OCB tail, at the edge of the OCB body or at the surface of the OCB where the OCB is connected to optical fibre cables and/or optical components.

3.1.9

alignment mark for assembly of OCB

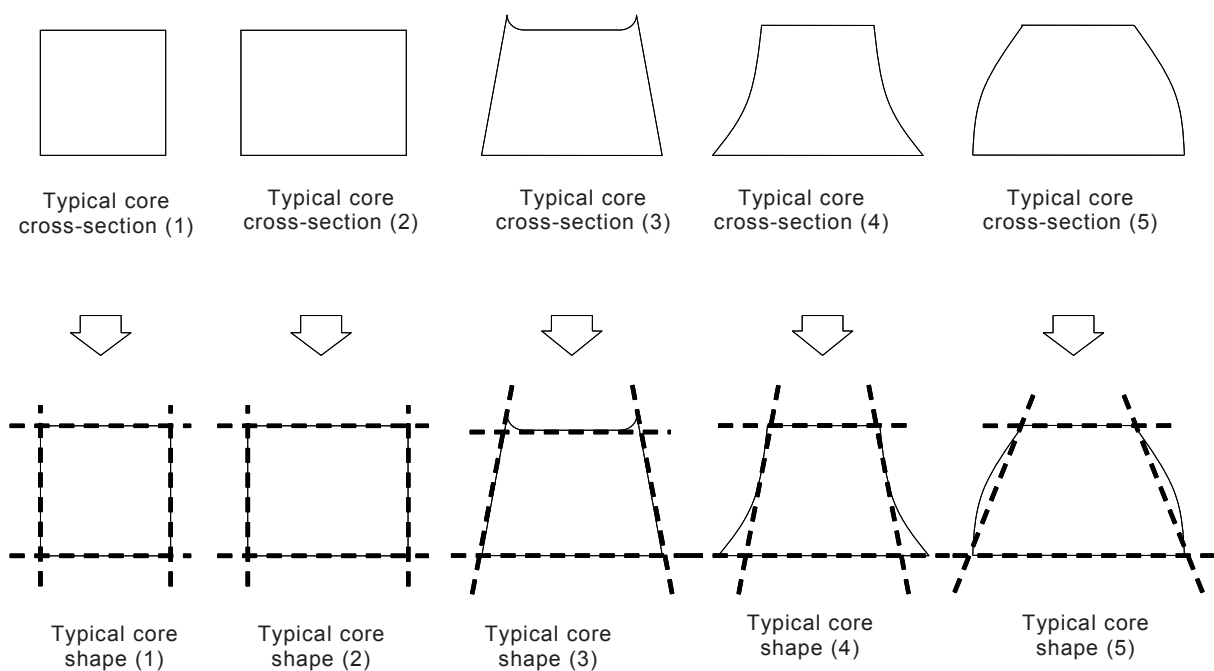
mark on the OCB body, typically a through hole in the OCB body, for assembly of the OCB to another board and/or equipment

NOTE The coordinates of the alignment mark are defined by the coordinates at the centre of the mark. The alignment mark is used instead of a datum target in Annex A.

3.2 Core shape definitions

There are two types of core shape, square or circular, for waveguide OCBs

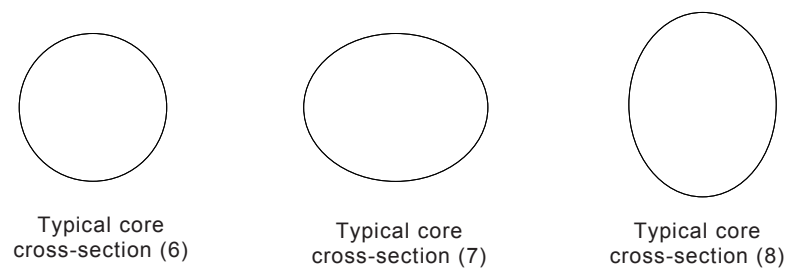
EXAMPLE 1 Square shape consists of four corners formed by extrapolating or interpolating an arbitrary shape by four straight lines, as shown in Figure 1.



IEC 018/11

**Figure 1 – Examples of shapes of square core
(quasi-square made by extrapolation or interpolation)**

EXAMPLE 2 Circular shape has round boundaries. It is not necessarily perfectly circular and includes elliptical shapes or any round shapes. Examples of circular shapes are shown in Figure 2.



IEC 019/11

Figure 2 – Examples of shapes of circular core

The six structural parameters for the square core shape are shown in Figure 3. Structural parameters for the circle core shape are defined by NFP (near field pattern) observation of a cross section (see IEC 60793-1-45).

3.2.1

core width (top)

upper horizontal component of the core shape

3.2.2

core width (bottom)

lower horizontal component of the core shape

3.2.3

core height

distance between the lower and upper horizontal lines

3.2.4

core centre

intersection point of two diagonal lines of a quadrangle consisting of four midpoints of four lines of the core shape, as illustrated in Figure 3

NOTE This intersection point corresponds to the centre of gravity in a system of material points.

3.2.5

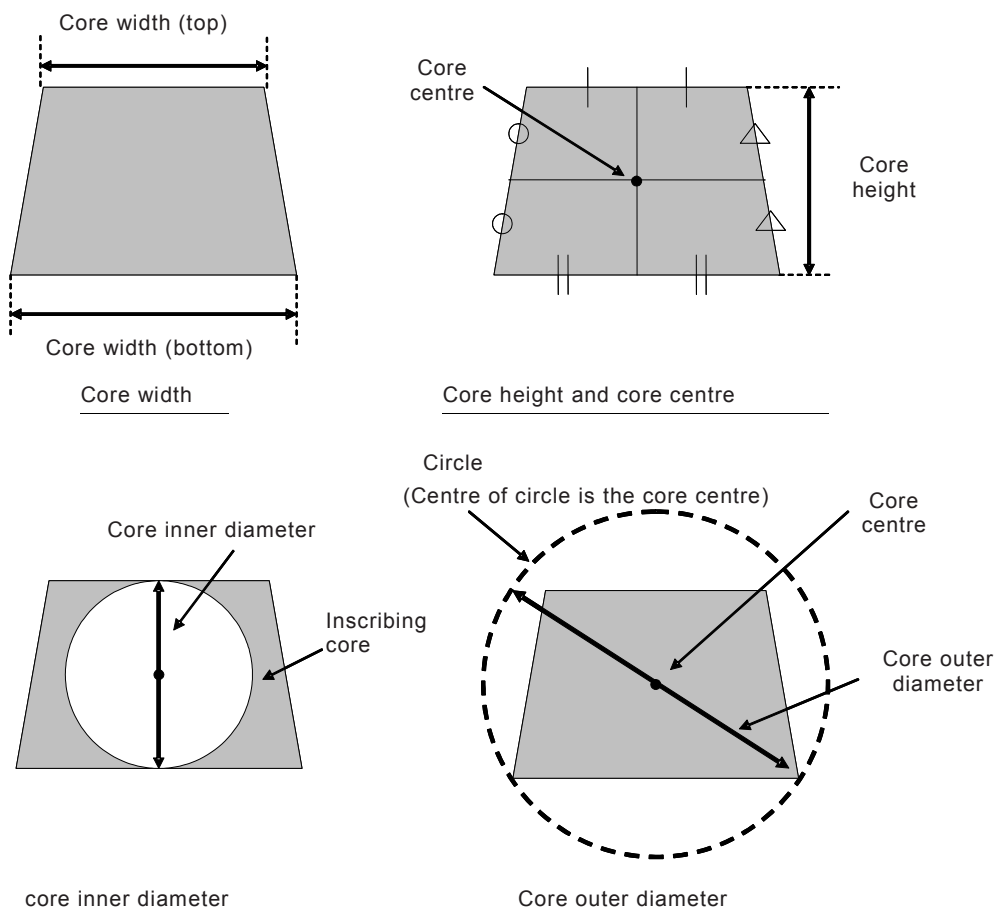
core inner diameter

diameter of an inscribing circle with its centre at the core centre

3.2.6

core outer diameter

twice the distance between the core centre and the farthest corner of the core shape



IEC 020/11

Figure 3 – Six structural parameters of square core shape of waveguide OCB

4 Coordinates of I/O ports of waveguide OCB

4.1 Structural types of waveguide OCB

OCBs are divided into two types defined by the positions and orientations of their optical I/O ports. According to one type, the input / output port is defined by the exposed cross-section of a waveguide at an edge of the board (end face I/O type), as illustrated in Figure 4, or at an edge of a hole formed inside the area of the board, as illustrated in Figure 5. According to another type, the input / output port contains an optical path converter such as a mirror to deflect optical signals out of or into the surface of the board (surface I/O type), as illustrated in Figure 6. An optical path converter can also be defined by a waveguide, which is bent towards the surface of the board, such that its cross-section is exposed on the surface of the