



BSI Standards Publication

Optical circuit boards

Part 2-2: Measurements — Dimensions
of optical circuit boards

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National foreword

This British Standard is the UK implementation of EN 62496-2-2:2011. It is identical to IEC 62496-2-2:2011.

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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EN 62496-2-2

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English version

**Optical circuit boards -
Part 2-2: Measurements -
Dimensions of optical circuit boards
(IEC 62496-2-2:2011)**

Cartes à circuits optiques -
Partie 2-2: Mesures -
Dimensions des cartes à circuits optiques
(CEI 62496-2-2:2011)

Optische Leiterplatten -
Teil 2-2: Messungen -
Abmessungen optischer Leiterplatten
(IEC 62496-2-2:2011)

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European Committee for Electrotechnical Standardization
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Foreword

The text of document 86/378/FDIS, future edition 1 of IEC 62496-2-2, prepared by IEC TC 86, Fibre optics, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 62496-2-2 on 2011-03-03.

The following dates were fixed:

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with the EN have to be withdrawn (dow) 2014-03-03

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 62496-2-2:2011 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 60793-2	NOTE	Harmonized as EN 60793-2.
IEC 62496 series	NOTE	Harmonized in EN 62496 series.

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 60068-1	-	Environmental testing - Part 1: General and guidance	EN 60068-1	-
IEC 60793-1-45 (mod)	-	Optical fibres - Part 1-45: Measurement methods and test procedures - Mode field diameter	EN 60793-1-45	-
IEC 61189-2	-	Test methods for electrical materials, printed boards and other interconnection structures and assemblies - Part 2: Test methods for materials for interconnection structures	EN 61189-2	-
IEC 62496-2-1	-	Optical circuit boards - Basic test and measurement procedures - Part 2-1: Measurements - Optical attenuation and isolation	FprEN 62496-2-1	-
IEC 62496-4	-	Optical circuit boards - Part 4: Interface standards - General and guidance	FprEN 62496-4	-
ISO 10360-2	-	Geometrical product specifications (GPS) - Acceptance and reverification tests for coordinate measuring machines (CMM) - Part 2: CMMs used for measuring linear dimensions	EN ISO 10360-2	-

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OPTICAL CIRCUIT BOARDS –

Part 2-2: Measurements – Dimensions of optical circuit boards

1 Scope

This part of IEC 62496 specifies the measurement procedures for dimensions related to interface information of optical circuit boards (OCB), defined in IEC 62496-4.

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 60068-1, *Environmental testing – Part 1: General and guidance*

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

IEC 61189-2, *Test methods for electrical materials, printed boards and other interconnection structures and assemblies – Part 2: Test methods for materials for interconnection structures*

IEC 62496-2-1, *Optical circuit boards – Part 2-1: Measurements – Optical attenuation and isolation*¹

IEC 62496-4, *Optical circuit boards – Part 4: Interface standards – General and guidance*

ISO 10360-2, *Geometrical product specifications (GPS) – Acceptance and reverification tests for coordinate measuring machines (CMM) – Part 2: CMMs used for measuring linear dimensions*

3 Terms and definitions

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

3.1

optical position adjusting system

consists of a light source, fibre position adjustment stage, OCB holder, input/output fibre and a power meter. The optimum fibre launch position, at which the optical output power is maximised, is determined through alignment of the input/output fibres to the OCB and monitoring the output power from the OCB

3.2

dimensional drawing

illustration, including dashed lines, which defines classified OCB or OCB body shape accuracy using the origin point or alignment mark as the standard point

¹ To be published.

4 Measurement condition

All the measurements are made under the conditions specified in IEC 60068-1, unless otherwise specified. Measurements may be made under different conditions to the standard conditions if the standard conditions are difficult to achieve, as long as the actual measurement condition does not give rise to any doubt as to the result of the measurement.

5 Objects to be measured and their procedures

Objects to be measured as dimensions of OCB are stated in IEC 62496-4. The objects and their methods are summarized in Table 1. This standard specifies mainly mechanical procedures using observation systems for dimensions of OCBs.

Table 1 – Objects to be measured and their methods

	Method 1 (reference)	Method 2 (alternative)			
	Observation system	Optical position adjustment	Dimensional drawing	Confocal microscope	Laser scanning
Core shape	O				
Coordinates of I/O port	O	O			
Outer shape of OCB	O		O		
Misalignment angles of I/O	O				
Mirror	O			O	
Hole	O				O

6 Measurement procedures for dimensions

6.1 Core shape

6.1.1 Measuring equipment

6.1.1.1 General

The measuring equipment consists of observation, shape measuring and data processing systems. The measurement system shall give reproducible results. An example of a total measuring system is illustrated in Figure 1. Structural parameters for circular core shape are obtained by near field pattern observation of cross section specified in IEC 60793-1-45.

6.1.1.2 Observation system

The observation system detects a core shape by an optical microscope with resolution of less than 1 % of designated dimension. It is necessary to select appropriate lighting, magnification, detection system and fibre positioning system to obtain sufficient measurement accuracy, but x10 to x80 for the object lens and x10 for the eyepiece seem appropriate. A camera is also used for the observation of large core shape. An example of sample set-up for the observation is illustrated in Figures 2 and 3. A light is launched in the vicinity of one of I/O ports. The output light from the sample is detected from the other one by the observation system. A movable stage or the observation system can have the measuring function. The movable stage should be controllable in x, y and z axes and vertical and horizontal rotations, independently.

6.1.1.3 Data processing system

The data processing system has the capability of analyzing image information taken from the observation system and calculates structural parameters of core shape.

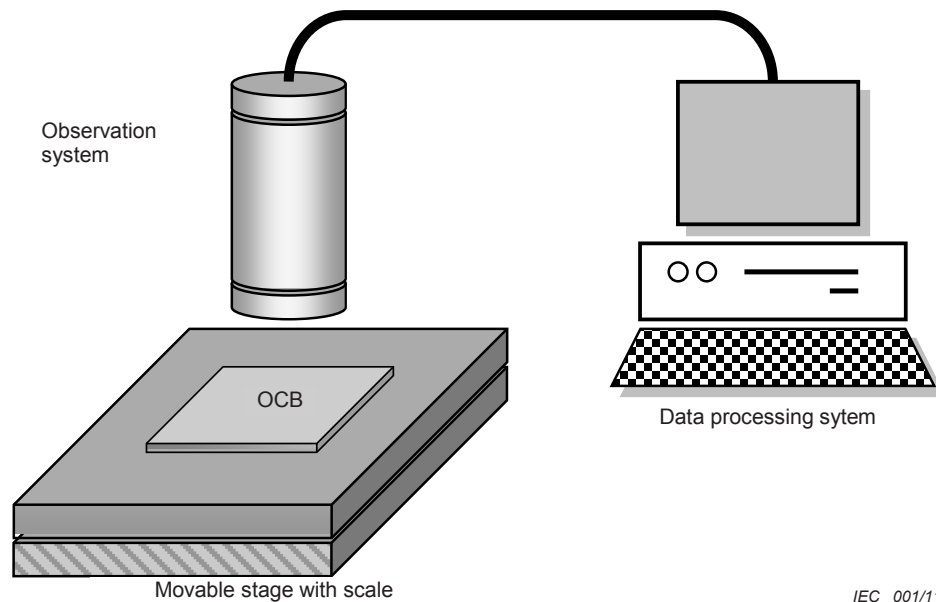


Figure 1 – Example of measuring equipment capable of observing core shape

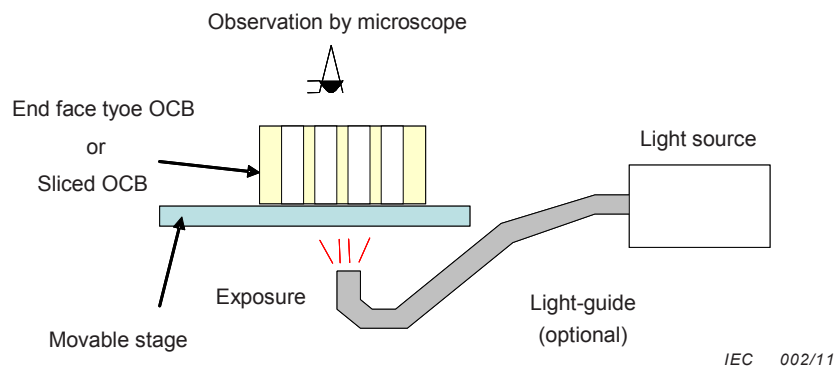


**Figure 2 – Example of sample set-up for observation of core shape
(end face I/O type OCB or a sliced sample)**