SLOVENSKI STANDARD
SIST EN 62496-2-1:2011

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Plošče z optičnimi vezji - 2-1. del: Meritve - Optično slabljenje in izolacija (IEC 62496-2-1:2011)

Optical circuit boards - Part 2-1: Measurements - Optical attenuation and isolation (IEC 62496-2-1:2011)

Optische Leiterplatten - Teil 2-1: Messungen - Optische Dämpfung und Isolation (IEC 62496-2-1:2011)

Cartes à circuits optiques - Partie 2-1: Mesures - Affaiblissement et isolation optiques (CEI 62496-2-1:2011)

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ICS:

31.180	Tiskana vezja (TIV) in tiskane plošče	Printed circuits and boards
33.180.01	Sistemi z optičnimi vlakni na splošno	Fibre optic systems in general

SIST EN 62496-2-1:2011 **en**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 62496-2-1

September 2011

ICS 33.180.01

English version

Optical circuit boards - Part 2-1: Measurements - Optical attenuation and isolation (IEC 62496-2-1:2011)

Cartes à circuits optiques -
Partie 2-1: Mesures -
Affaiblissement et isolation optiques
(CEI 62496-2-1:2011)

Optische Leiterplatten -
Teil 2-1: Messungen -
Optische Dämpfung und Isolation
(IEC 62496-2-1:2011)

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CENELEC
European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

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Foreword

The text of document (86/396/FDIS), future edition 1 of IEC 62496-2-1, prepared by IEC TC 86, "Fibre optics" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 62496-2-1:2011.

The following dates are fixed:

• latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2012-06-01
• latest date by which the national standards conflicting with the document have to be withdrawn	(dow)	2014-09-01

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The text of the International Standard IEC 62496-2-1:2011 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 60793-1-1	NOTE	Harmonized as EN 60793-1-1.
IEC 60794-1-1	NOTE	Harmonized as EN 60794-1-1.
IEC 61280-4-1	NOTE	Harmonized as EN 61280-4-1.
IEC 61300-3-35	NOTE	Harmonized as EN 61300-3-35.

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.

Publication	Year	Title	EN/HD	Year
IEC 60793-2-10	-	Optical fibres - Part 2-10: Product specifications - Sectional specification for category A1 multimode fibres	EN 60793-2-10	-
IEC 60793-2-50	-	Optical fibres - Part 2-50: Product specifications - Sectional specification for class B single-mode fibres	EN 60793-2-50	-
IEC 60825-1	-	Safety of laser products - Part 1: Equipment classification and requirements	EN 60825-1	-
IEC 61300-1	-	Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 1: General and guidance	EN 61300-1	-
IEC 61300-3-1	2005	Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 3-1: Examinations and measurements - Visual examination	EN 61300-3-1	2005
IEC 61300-3-4	-	Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 3-4: Examinations and measurements - Attenuation	EN 61300-3-4	-
IEC 62496-1	2008	Optical circuit boards - Part 1: General	EN 62496-1	2009
IEC 62614	-	Fibre optics - Launch condition requirements for measuring multimode attenuation	EN 62614	-
ISO 3599	-	Vernier callipers reading to 0,1 and 0,05 mm	-	-
ISO 6906	-	Vernier callipers reading to 0,02 mm	-	-

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NORME INTERNATIONALE

Optical circuit boards – Part 2-1: Measurements – Optical attenuation and isolation

Cartes à circuits optiques – Partie 2-1: Mesures – Affaiblissement et isolation optiques

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

OPTICAL CIRCUIT BOARDS –

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FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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International Standard IEC 62496-2-1 has been prepared by IEC technical committee 86: Fibre optics.

The text of this standard is based on the following documents:

FDIS	Report on voting
86/396/FDIS	86/401/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts of the IEC 62496 series, published under the general title *Optical circuit boards* can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

OPTICAL CIRCUIT BOARDS –

Part 2-1: Measurements – Optical attenuation and isolation

1 Scope

IEC 62496-2-1 describes the various methods to measure the optical attenuation and isolation of optical circuit boards (OCBs).

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 60793-2-10, *Optical fibres - Part 2-10: Product specifications - Sectional specification for category A1 multimode fibres*

IEC 60793-2-50, *Optical fibres - Part 2-50: Product specifications - Sectional specification for class B single-mode fibres*

IEC 60825-1, *Safety of laser products – Part 1: Equipment classification and requirements*

IEC 61300-1, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 1: General and guidance*

IEC 61300-3-1:2003, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 3-1: Examinations and measurements – Visual examination*

IEC 61300-3-4, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 3-4: Examinations and measurements – Attenuation*

IEC 62496-1:2008, *Optical circuit boards – Part 1: General*

IEC 62614, *Fibre optics – Launch condition requirements for measuring multimode attenuation*

ISO 3599, *Vernier callipers reading to 0,1 and 0,05 mm*

ISO 6906, *Vernier callipers reading to 0,02 mm*

3 Precautions

The requirements of IEC 60825-1 and the following test requirements shall be met.

The position of the fibres in the test should be fixed during the measurement to avoid changes in attenuation caused by bending loss.

4 Apparatus

4.1 Launch conditions and source (S)

For multimode measurements, a restricted launch, not an overfilled launch, shall be used. Encircled flux, which is given in IEC 62614, shall be available for the purposes of launching fibre qualification in case of a 50 or 62,5 graded index launch fibre. The required launch conditions can be achieved by including appropriate equipment inside the light source, or by applying mode filters on or in series with the launch cord.

For single-mode measurements, the launch condition shall be in accordance with Annex B of IEC 61300-1.

The source unit consists of an optical emitter, the associated drive electronics and fibre pigtail. Preferred source and launch conditions are given in Table 1.

Table 1 – Preferred source and launch conditions

No.	Type	Centre wavelength nm	Spectral width nm	Stability at 23 °C dB/h	Output power	Launch conditions	Source type
S1	Multimode	660 ± 30	≥30	± 0,05	[a]	TBD	Laser diode or LED
S2	Multimode	780 ± 30	≥30	± 0,05	[a]	TBD	Laser diode or LED
S3	Multimode	850 ± 30	≥30	± 0,05	[a]	IEC 62614	Laser diode or LED
S4	Multimode	980 ± 30	≥30	± 0,05	[a]	TBD	Laser diode or LED
S5	Multimode	1 300 ± 30	≥30	± 0,05	[a]	IEC 62614	Laser diode or LED
S6	Single-mode	1 310 ± 30	≤10	± 0,05	[a]	IEC 61300-1, Annex B.2.2	Laser diode or LED
S7	Single-mode	1 550 ± 30	≤10	± 0,05	[a]	IEC 61300-1, Annex B.2.2	Laser diode or LED

[a] The source output power shall be ≥20 dB above the minimum measured power level.

NOTE 1 Due to their long coherence length, laser source units create a speckle pattern across the core of a multimode fibre that is unstable and which may render difficult or impossible the task of creating case 2 launch conditions in a multimode component. Consequently, for measuring multimode components, lasers, should be avoided in favour of LEDs or other incoherent source units.

NOTE 2 For S5 and S6, where an LED is used, the spectral width is more typically ≤150 nm.

NOTE 3 It is recognized that new components may require the use of other source types such as tunable lasers. It is therefore recommended in these cases that the preferred source characteristics be specified on the basis of the component to be measured.

4.2 Power-meter (D)

The power-meter unit consists of an optical detector, the mechanism for connecting to it and associated detection electronics. The connection between the detector and a receiving fibre will either be with an adaptor that accepts a bare fibre or a connector plug of appropriate design.

The measurement system shall be stable within specified limits over the period of time required to measure an optical power. For measurements where the connection to the detector must be broken between the measurement of the optical power, the measurement