

STN	<p>Dosky s optickými obvodmi Základné skúšobné a meracie postupy Časť 2-5: Skúška ohybnosti ohybných optoelektrických obvodov</p>	<p>STN EN IEC 62496-2-5</p>
		35 9285

Optical circuit boards - Basic test and measurement procedures - Part 2-5: Flexibility test for flexible opto-electric circuits

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 03/23

Obsahuje: EN IEC 62496-2-5:2023, IEC 62496-2-5:2022

136568



EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN IEC 62496-2-5

January 2023

ICS 33.180.01

English Version

Optical circuit boards - Basic test and measurement procedures
- Part 2-5: Flexibility test for flexible opto-electric circuits
(IEC 62496-2-5:2022)

Cartes à circuits optiques - Procédures fondamentales
d'essais et de mesures - Partie 2-5: Essai de flexibilité pour
les circuits optoélectriques souples
(IEC 62496-2-5:2022)

Optische Leiterplatten - Grundlegende Prüf- und
Messverfahren - Teil 2-5: Biegsamkeitstest für biegsame
opto-elektrische Schaltkreise
(IEC 62496-2-5:2022)

This European Standard was approved by CENELEC on 2023-01-11. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom.



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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

EN IEC 62496-2-5:2023 (E)**European foreword**

The text of document 86/605/FDIS, future edition 1 of IEC 62496-2-5, prepared by IEC/TC 86 "Fibre optics" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 62496-2-5:2023.

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) 2023-10-11
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2026-01-11

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC shall not be held responsible for identifying any or all such patent rights.

Any feedback and questions on this document should be directed to the users' national committee. A complete listing of these bodies can be found on the CENELEC website.

Endorsement notice

The text of the International Standard IEC 62496-2-5:2022 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 standard indicated:

IEC 60793-2-10 NOTE Harmonized as EN IEC 60793-2-10

IEC 60793-2-20 NOTE Harmonized as EN 60793-2-20

Annex ZA
(normative)**Normative references to international publications
with their corresponding European publications**

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.

NOTE 1 Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

<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 60793-2	series	Optical fibres - Part 2: Product specifications	EN IEC 60793-2	series
IEC 62496-2-1	-	Optical circuit boards - Part 2-1: Measurements - Optical attenuation and isolation	EN 62496-2-1	-
ISO 5626	1993	Paper - determination of folding endurance -		-



IEC 62496-2-5

Edition 1.0 2022-12

INTERNATIONAL STANDARD

NORME INTERNATIONALE



**Optical circuit boards – Basic test and measurement procedures –
Part 2-5: Flexibility test for flexible opto-electric circuits**

**Cartes à circuits optiques – Procédures fondamentales d'essais et de mesures –
Partie 2-5: Essai de flexibilité pour les circuits optoélectriques souples**





THIS PUBLICATION IS COPYRIGHT PROTECTED
Copyright © 2022 IEC, Geneva, Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either IEC or IEC's member National Committee in the country of the requester. If you have any questions about IEC copyright or have an enquiry about obtaining additional rights to this publication, please contact the address below or your local IEC member National Committee for further information.

Droits de reproduction réservés. Sauf indication contraire, aucune partie de cette publication ne peut être reproduite ni utilisée sous quelque forme que ce soit et par aucun procédé, électronique ou mécanique, y compris la photocopie et les microfilms, sans l'accord écrit de l'IEC ou du Comité national de l'IEC du pays du demandeur. Si vous avez des questions sur le copyright de l'IEC ou si vous désirez obtenir des droits supplémentaires sur cette publication, utilisez les coordonnées ci-après ou contactez le Comité national de l'IEC de votre pays de résidence.

IEC Secretariat
 3, rue de Varembé
 CH-1211 Geneva 20
 Switzerland

Tel.: +41 22 919 02 11
info@iec.ch
www.iec.ch

About the IEC

The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

About IEC publications

The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigendum or an amendment might have been published.

IEC publications search - webstore.iec.ch/advsearchform
 The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee, ...). It also gives information on projects, replaced and withdrawn publications.

IEC Just Published - webstore.iec.ch/justpublished
 Stay up to date on all new IEC publications. Just Published details all new publications released. Available online and once a month by email.

IEC Customer Service Centre - webstore.iec.ch/csc
 If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: sales@iec.ch.

IEC Products & Services Portal - products.iec.ch

Discover our powerful search engine and read freely all the publications previews. With a subscription you will always have access to up to date content tailored to your needs.

Electropedia - www.electropedia.org

The world's leading online dictionary on electrotechnology, containing more than 22 300 terminological entries in English and French, with equivalent terms in 19 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

A propos de l'IEC

La Commission Electrotechnique Internationale (IEC) est la première organisation mondiale qui élabore et publie des Normes internationales pour tout ce qui a trait à l'électricité, à l'électronique et aux technologies apparentées.

A propos des publications IEC

Le contenu technique des publications IEC est constamment revu. Veuillez vous assurer que vous possédez l'édition la plus récente, un corrigendum ou amendement peut avoir été publié.

Recherche de publications IEC - webstore.iec.ch/advsearchform

La recherche avancée permet de trouver des publications IEC en utilisant différents critères (numéro de référence, texte, comité d'études, ...). Elle donne aussi des informations sur les projets et les publications remplacées ou retirées.

IEC Just Published - webstore.iec.ch/justpublished

Restez informé sur les nouvelles publications IEC. Just Published détaille les nouvelles publications parues. Disponible en ligne et une fois par mois par email.

Service Clients - webstore.iec.ch/csc

Si vous désirez nous donner des commentaires sur cette publication ou si vous avez des questions contactez-nous: sales@iec.ch.

IEC Products & Services Portal - products.iec.ch

Découvrez notre puissant moteur de recherche et consultez gratuitement tous les aperçus des publications. Avec un abonnement, vous aurez toujours accès à un contenu à jour adapté à vos besoins.

Electropedia - www.electropedia.org

Le premier dictionnaire d'électrotechnologie en ligne au monde, avec plus de 22 300 articles terminologiques en anglais et en français, ainsi que les termes équivalents dans 19 langues additionnelles. Egalement appelé Vocabulaire Electrotechnique International (IEV) en ligne.



IEC 62496-2-5

Edition 1.0 2022-12

INTERNATIONAL STANDARD

NORME INTERNATIONALE



**Optical circuit boards – Basic test and measurement procedures –
Part 2-5: Flexibility test for flexible opto-electric circuits**

Cartes à circuits optiques – Procédures fondamentales d'essais et de mesures

**–
Partie 2-5: Essai de flexibilité pour les circuits optoélectriques souples**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

ICS 33.180.01

ISBN 978-2-8322-6119-4

Warning! Make sure that you obtained this publication from an authorized distributor.

Attention! Veuillez vous assurer que vous avez obtenu cette publication via un distributeur agréé.

CONTENTS

FOREWORD	4
1 Scope	6
2 Normative references	6
3 Terms and definitions	6
4 Apparatus	7
4.1 General description	7
4.2 Flexibility tester for flexibility test of FOECBs	8
4.2.1 FOECBs test sample of fibre optical types	8
4.2.2 FOECBs test sample of planer waveguide optical circuit types	8
4.3 O-E signal control source	9
4.4 Laser source	9
4.5 Photo detector	9
4.6 Folding jig	9
4.7 Relay switch	10
4.8 Main controller	10
5 Test sample	10
5.1 FOECB test samples of optical fibre-types	10
5.2 FOECB test samples of planar optical waveguide-types	11
6 Procedures	13
6.1 For test samples of optical fibre-types	13
6.1.1 Preparing test samples	13
6.1.2 Initial optical and electrical performance measurement	13
6.1.3 Setting the test sample	13
6.1.4 Flexibility measurement	14
6.1.5 Final optical and electrical performance measurement	14
6.1.6 Mechanical performance measurement	14
6.2 For test samples of the planar optical waveguide-types	14
6.2.1 Preparing test samples	14
6.2.2 Initial optical and electrical performance measurement	14
6.2.3 Setting the test sample	15
6.2.4 Flexibility measurement	15
6.2.5 Final optical and electrical performance measurement	15
6.2.6 Mechanical characteristic measurement	16
7 Report	16
Annex A (informative) Detail requirement for structure of FOECB test samples of optical fibre-types	17
Annex B (informative) Requirement for structure of FOECB test samples of planar optical waveguide-types	18
Annex C (informative) Guideline for flexibility folding jig setting conditions of FOECB test samples	19
Bibliography	20
Figure 1 – Schematic diagram of flexible opto-electric circuit board (top view)	7
Figure 2 – Overview of the folding jig	8
Figure 3 – Schematic diagram of the flexibility test system for fibre optical circuits	8

Figure 4 – Schematic diagram of the flexibility test system for planar waveguide optical circuits	9
Figure 5 – Flexibility folding jigs (from the left, folding radius r is 1,0 mm, 2,0 mm, 3,0 mm, 4,0 mm, 5,0 mm and 10,0 mm)	10
Figure 6 – Schematic diagram of FOECB test samples of optical fibre-types	11
Figure 7 – Schematic diagram of FOECB test samples of planar optical waveguide-types	12
Figure B.1 – Schematic diagram of the flexibility test system for planar waveguide optical circuits	18
Figure C.1 – An example of measurement result of optical loss versus bending diameter	19

INTERNATIONAL ELECTROTECHNICAL COMMISSION**OPTICAL CIRCUIT BOARDS –
BASIC TEST AND MEASUREMENT PROCEDURES –****Part 2-5: Flexibility test for flexible opto-electric circuits****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.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

IEC 62496-2-5 has been prepared by IEC technical committee 86: Fibre optics. It is an International Standard.

The text of this International Standard is based on the following documents:

Draft	Report on voting
86/605/FDIS	86/609/RVD

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

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/standardsdev/publications.

A list of all parts in 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 document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

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

IMPORTANT – The "colour inside" logo on the cover page of this document indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

**OPTICAL CIRCUIT BOARDS –
BASIC TEST AND MEASUREMENT PROCEDURES –****Part 2-5: Flexibility test for flexible opto-electric circuits****1 Scope**

This part of IEC 62496 defines a test method for folding flexibility inspection of flexible opto-electric circuits with a flexibility tester endurance tester and presents a guideline for a step stress test method for finding the predetermined minimum mechanical folding radii below which the flexible opto-electric circuits can be damaged by intended folding distortion. Here, test samples are used instead of products for the flexibility test of their flexible opto-electric circuits, and the test samples have the same material, layer structure, processing technology and equipment as the products.

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.

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

IEC 60793-2 (all parts), *Optical fibres – Part 2: Product specifications*

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

ISO 5626:1993, *Paper – Determination of folding endurance*

koniec náhľadu – text d'alej pokračuje v platenej verzii STN