

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Fibre optic interconnecting devices and passive components – Basic test and measurement procedures –
Part 2-11: Tests – Axial compression**

**Dispositifs d'interconnexion et composants passifs fibroniques – Procédures fondamentales d'essais et de mesures –
Partie 2-11: Essais – Compression axiale**

<https://standards.iteh.ai/catalog/standards/iec/0df28c6d-b0ff-4a64-8927-3886ed0be5bf/iec-61300-2-11-2023>





THIS PUBLICATION IS COPYRIGHT PROTECTED

Copyright © 2023 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 Varembe
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 It also gives information on projects, replaced and withdrawn publications.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.



INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Fibre optic interconnecting devices and passive components – Basic test and measurement procedures –
Part 2-11: Tests – Axial compression**

**Dispositifs d'interconnexion et composants passifs fibroniques – Procédures fondamentales d'essais et de mesures –
Partie 2-11: Essais – Compression axiale**

<https://standards.iteh.ai/catalog/standards/iec/0df28c6d-b0ff-4a64-8927-3886ed0be5bf/iec-61300-2-11-2023>

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

ICS 33.180.20

ISBN 978-2-8322-7874-1

**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..... | 3 |
| 1 Scope..... | 5 |
| 2 Normative references | 5 |
| 3 Terms, definitions, and abbreviated terms | 5 |
| 3.1 Terms and definitions..... | 5 |
| 3.2 Abbreviated terms..... | 5 |
| 4 General description | 5 |
| 5 Apparatus..... | 5 |
| 5.1 General..... | 5 |
| 5.2 Moveable clamping device | 6 |
| 5.3 Fixed clamping device | 6 |
| 5.4 Force generator | 6 |
| 5.5 Force gauge | 6 |
| 6 Procedure..... | 6 |
| 6.1 Preparation of DUT | 6 |
| 6.2 Preconditioning..... | 6 |
| 6.3 Mounting of the DUT..... | 6 |
| 6.4 Initial examination..... | 7 |
| 6.5 Application of load | 7 |
| 6.6 Recovery | 7 |
| 6.7 Final examination..... | 7 |
| 7 Severity | 7 |
| 8 Details to be specified and reported..... | 8 |
| Bibliography..... | 9 |
| Figure 1 – Example of test set-up | 7 |
| Table 1 – Recommended severity levels | 8 |

<https://standards.iteh.ai/catalog/standards/iec/0df28c6d-b0ff-4a64-8927-3886ed0be5bf/iec-61300-2-11-2023>

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**FIBRE OPTIC INTERCONNECTING
DEVICES AND PASSIVE COMPONENTS –
BASIC TEST AND MEASUREMENT PROCEDURES –****Part 2-11: Tests – Axial compression**

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) IEC draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). IEC takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, IEC had not received notice of (a) patent(s), which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at <https://patents.iec.ch>. IEC shall not be held responsible for identifying any or all such patent rights.

IEC 61300-2-11 has been prepared by subcommittee 86B: Fibre optic interconnecting devices and passive components, of IEC technical committee 86: Fibre optics. It is an International Standard.

This third edition cancels and replaces the second edition published in 2012. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) added Terms and definitions clause;
- b) removed severity table for closures;

c) added recommended severity for tubes and cables without strength member attachment.

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

| Draft | Report on voting |
|---------------|------------------|
| 86B/4807/FDIS | 86B/4824/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/publications.

A list of all parts in the IEC 61300 series, published under the general title *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures*, 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, or
- revised.

(<https://standards.iteh.ai>)
Document Preview

[IEC 61300-2-11:2023](https://standards.iteh.ai/catalog/standards/iec/0df28c6d-b0ff-4a64-8927-3886ed0be5bf/iec-61300-2-11-2023)

<https://standards.iteh.ai/catalog/standards/iec/0df28c6d-b0ff-4a64-8927-3886ed0be5bf/iec-61300-2-11-2023>

FIBRE OPTIC INTERCONNECTING DEVICES AND PASSIVE COMPONENTS – BASIC TEST AND MEASUREMENT PROCEDURES –

Part 2-11: Tests – Axial compression

1 Scope

The purpose of this part of IEC 61300 is to ensure that the captivation or the attachment of the cable to the fibre optic devices or components, for example fibre optic closures, will withstand compressive axial loads likely to be applied during normal service.

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

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

3 Terms, definitions, and abbreviated terms

3.1 Terms and definitions

No terms and definitions are listed in this document.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- IEC Electropedia: available at <https://www.electropedia.org/>
- ISO Online browsing platform: available at <https://www.iso.org/obp>

3.2 Abbreviated terms

DUT device under test

4 General description

The DUT is rigidly clamped and an axial compressive load is applied to the cable.

5 Apparatus

5.1 General

The test apparatus shall be capable of applying an axial compression load between a clamped device or component and a fixed cable. The apparatus consists of the elements described in 5.2 to 5.5.

5.2 Moveable clamping device

A clamping device which grips a length of fibre optic cable over a distance equivalent to at least three times the cable diameter (see Figure 1, dimension A), and which is capable of providing an axial load without slipping, causing damage to the cable or increasing attenuation.

5.3 Fixed clamping device

A fixed clamping device capable of gripping the device or component without altering any of its mechanical properties.

5.4 Force generator

A force generator may be any device or apparatus capable of smoothly applying the specified force at the specified rate.

5.5 Force gauge

An instrument for measuring the applied force being exerted between the device or component and the fibre optic cable.

6 Procedure

6.1 Preparation of DUT

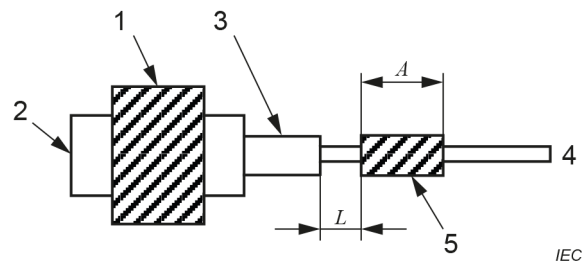
The DUT shall consist of a fully assembled optical device or component where one or more cables are fixed and prepared in accordance with the manufacturer's instructions. The DUT shall be subjected to the following test procedure in non-operational mode.

6.2 Preconditioning

Precondition each prepared DUT for at least 2 h at the standard atmospheric conditions specified in IEC 61300-1.

6.3 Mounting of the DUT

Securely fix the device or component to the fixed clamping device. See Figure 1 for an example of the test set-up. Clamp the cable at the point of application using a moveable clamping device such that the distance, L , between the rear of the strain relief and the front of the moveable clamping device is at maximum twice the cable diameter to prevent cable buckling.

**Key**

- 1 fixed clamping device
- 2 device or component
- 3 strain relief
- 4 fibre optic cable
- 5 movable clamping device
- A* cable clamp length (at least three times the cable diameter)
- L* length between rear of strain relief and cable clamp (maximum two times the cable diameter)

Figure 1 – Example of test set-up**6.4 Initial examination**

The DUT shall be visually inspected according to IEC 61300-3-1.

6.5 Application of load

Smoothly apply the axial compressive load to the cable, as recommended in Table 1. Maintain the load for a minimum of 2 min. The position of the point of application shall be such that the load is axially transmitted.

6.6 Recovery

Allow DUT to recover for at least 4 h at standard atmospheric conditions specified in IEC 61300-1.

6.7 Final examination

Remove the axial compressive load from the DUT and the DUT from the test mounting. Visually examine the DUT and its component parts in accordance with IEC 61300-3-1. Check for evidence of cracking, loose parts, chipped parts, scratches, permanent deformation, displacement, excessive movements or other damage to cable jacket, seals, strain relief or fibres which might impair its function, and against any other pass/fail criteria specified in the relevant IEC 61753 performance standard or IEC 62005 reliability specification. Careful attention shall be given to degradation of the optical signal, fibre breakage and excessive movement of the cable relative to the DUT.

7 Severity

Table 1 shows the specified test severities in relation to the performance categories. It is recommended to verify the test severities with the relevant IEC 61753 performance standards and IEC 62005 reliability specifications for the normative values.

Table 1 – Recommended severity levels

| Category | Cable diameter mm | Load N |
|------------|---|-----------|
| C, A, G, S | < 3 | 10 |
| | ≥ 3 to < 6 | 20 |
| | ≥ 6 to < 10 | 50 |
| | ≥ 10 to < 20 | 100 |
| | ≥ 20 | 200 |
| | For tubes and cables without strength member attachment | 10 |

8 Details to be specified and reported

The following details, as applicable, shall be specified in the relevant specification and shall be reported in the test report:

- magnitude of the load;
- duration of the axial compression load if other than 2 min;
- cable type, diameter;
- type of load application;
- description of DUT;
- pre-conditioning procedure;
- initial examinations and measurements and performance requirements;
- examinations and measurements during test and performance requirements, if required;
- final examinations and measurements and performance requirements;
- optical measurement method, if necessary;
- deviations from test procedure;
- additional pass/fail criteria.

iTeh Standards
(<https://standards.itih.ai>)
Document Preview

https://standards.itih.ai/catalog/standard/iec/61300-2-11-2023/b0ff-4a64-8927-3886ed0be5bf/iec-61300-2-11-2023