
Optični spojni elementi in pasivne komponente - Osnovni preskusni in merilni postopki - 2-1. del: Preskusi - Vibracija (sinusoidna)

Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 2-1: Tests - Vibration (sinusoidal)

Lichtwellenleiter - Verbindungselemente und passive Bauteile - Grundlegende Prüf- und Messverfahren - Teil 2-1: Prüfungen - Schwingung (sinusförmig)

Dispositifs d'interconnexion et composants passifs à fibres optiques - Méthodes fondamentales d'essais et de mesures - Partie 2-1: Essais - Vibrations (sinusoïdales)

Ta slovenski standard je istoveten z: prEN IEC 61300-2-1:2022

<http://standards.iteh.ai/catalog/standards/sist/c2-4086c3-13a2-4cd9-a470-1f9036eb5e2f/osist-pren-iec-61300-2-1-2022>

ICS:

17.160	Vibracije, meritve udarcev in vibracij	Vibrations, shock and vibration measurements
33.180.20	Povezovalne naprave za optična vlakna	Fibre optic interconnecting devices

oSIST prEN IEC 61300-2-1:2022**en**



86B/4548/CDV

COMMITTEE DRAFT FOR VOTE (CDV)

PROJECT NUMBER: IEC 61300-2-1 ED4	
DATE OF CIRCULATION: 2021-12-31	CLOSING DATE FOR VOTING: 2022-03-25
SUPERSEDES DOCUMENTS: 86B/4355/CD, 86B/4411A/CC	

IEC SC 86B : FIBRE OPTIC INTERCONNECTING DEVICES AND PASSIVE COMPONENTS	
SECRETARIAT: Japan	SECRETARY: Mr Shigeru Tomita
OF INTEREST TO THE FOLLOWING COMMITTEES:	PROPOSED HORIZONTAL STANDARD: <input type="checkbox"/> Other TC/SCs are requested to indicate their interest, if any, in this CDV to the secretary.
FUNCTIONS CONCERNED: <input type="checkbox"/> EMC <input type="checkbox"/> ENVIRONMENT <input type="checkbox"/> QUALITY ASSURANCE <input type="checkbox"/> SAFETY	
<input checked="" type="checkbox"/> SUBMITTED FOR CENELEC PARALLEL VOTING	<input type="checkbox"/> NOT SUBMITTED FOR CENELEC PARALLEL VOTING
<p>Attention IEC-CENELEC parallel voting</p> <p>The attention of IEC National Committees, members of CENELEC, is drawn to the fact that this Committee Draft for Vote (CDV) is submitted for parallel voting.</p> <p>The CENELEC members are invited to vote through the CENELEC online voting system.</p>	

This document is still under study and subject to change. It should not be used for reference purposes.

Recipients of this document are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

TITLE:

Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 2-1: Tests - Vibration (sinusoidal)

PROPOSED STABILITY DATE: 2032

NOTE FROM TC/SC OFFICERS:

1	FOREWORD.....	3
2	1 Scope.....	5
3	2 Normative references	5
4	3 Terms and definitions	5
5	4 General description	5
6	5 Apparatus.....	6
7	5.1 General.....	6
8	5.2 Vibration generator	6
9	5.3 Mounting fixture	6
10	5.4 Acceleration Monitoring Device.....	6
11	5.5 Measuring equipment.....	6
12	6 Procedure.....	6
13	6.1 Preparation of DUT	6
14	6.2 Pre-conditioning.....	6
15	6.3 Initial examination and measurement	6
16	6.4 Mounting and test description	7
17	6.5 Monitoring.....	7
18	6.6 Recovery	7
19	6.7 Final examination and measurement.....	7
20	7 Severity	8
21	8 Details to be specified	10
22		
23	Figure 1 – Example of vibration apparatus	7
24		
25	Table 1 – Recommended values of the test parameters for connectors and passive components	8
26		
27	Table 2 – Recommended values of the test parameters for fibre management systems	8
28	Table 3 - Recommended values of the test parameters for mechanical splices and Field mountable connectors	8
29		
30	Table 4 - Recommended values of the test parameters for wall outlets and optical distribution frame modules.....	9
31		
32	Table 5 - Recommended values of the test parameters for hardened optical connectors	9
33	Table 6 - Recommended values of the test parameters for boxes and closures.....	9
34	Table 7 - Recommended values of the test parameters for street cabinets	10

35

36

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

Part 2-1: Tests – Vibration (sinusoidal)

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.

International Standard IEC 61300-2-1 has been prepared by subcommittee 86B: Fibre optic interconnecting devices and passive components, of IEC technical committee 86: Fibre optics.

This fourth edition of IEC 61300-2-1 cancels and replaces the third edition published in 2009 and COR1: 2010. Revisions for this document include:

- a) Harmonizing with the test conditions in IEC 61753-1: 2018 and revising severities;

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

FDIS	Report on voting
86B/2862/FDIS	86B/2903/RVD

89
90 Full information on the voting for the approval of this standard can be found in the report on
91 voting indicated in the above table.

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

93 A list of all parts of IEC 61300 series, published under the general title *Fibre optic*
94 *interconnecting devices and passive components – Basic test and measurement procedures*
95 can be found on the IEC website.

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

- 99 • reconfirmed,
- 100 • withdrawn,
- 101 • replaced by a revised edition, or
- 102 • amended.

103

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

104

105

<https://standards.iteh.ai/catalog/standards/sist/e24086c5-13a2-4cd9-a470-1f9036eb5e2f/osist-pren-iec-61300-2-1-2022>

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

Part 2-1: Tests – Vibration (sinusoidal)

1 Scope

This part of IEC 61300 evaluates the effects of vibration on fibre optic devices at the predominant frequency ranges and magnitudes that are encountered during field service on attenuation.

NOTE Most vibrations encountered in service are not of a simple harmonic nature. However, it has been shown that tests based on vibrations of this type are satisfactory to simulating actual service.

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 60068-2-6, *Environmental testing – Part 2-6: Tests – Test Fc: Vibration (sinusoidal)*

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*

IEC 61300-3-28, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 3-28: Examinations and measurements – Transient loss*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 61300-1 apply.

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

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

4 General description

This procedure is derived from IEC 60068-2-6, test Fc. The device under test (DUT) is mounted on a vibration generator and vibrated with a sinusoidal motion. The DUT is exposed to vibration in three mutually perpendicular directions, one of which is parallel to the optical axis. The vibration amplitude is specified either in terms of constant displacement or constant acceleration.

5 Apparatus

5.1 General

The apparatus shall be in accordance with IEC 60068-2-6, test Fc and consists of the following elements.

5.2 Vibration generator

A vibration generator capable of generating a sinusoidal excitation and its auxiliary test equipment.

5.3 Mounting fixture

A suitable DUT mounting fixture capable of transmitting the vibration conditions specified shall be used. The mounting fixture shall be designed so that the resonant vibration inherent in the fixture shall not have an effect on the specified frequency range.

5.4 Acceleration Monitoring Device

The amplitude and the acceleration of the applied vibration shall be monitored by an acceleration monitoring device, i.e. accelerometer on the mounting fixture near the DUT.

5.5 Measuring equipment

The transient loss measurement equipment specified in IEC 61300-3-28 shall be connected to the DUT and used to detect fast variation of attenuation during the test, unless otherwise specified in the relevant specification.

6 Procedure

6.1 Preparation of DUT

Prepare the DUT according to the manufacturer's instructions and as specified in the relevant specification.

6.2 Pre-conditioning

Pre-condition the DUT for more than or equal to 2 h at the standard atmospheric conditions specified in IEC 61300-1, unless otherwise specified in the relevant specification.

6.3 Initial examination and measurement

Complete initial examinations and measurements of the DUT as required by the relevant specification.

Unless otherwise specified, visually examine the DUT in accordance with IEC 61300-3-1. Check for evidence of any degradation in the DUT. The following are possible examples of degradation:

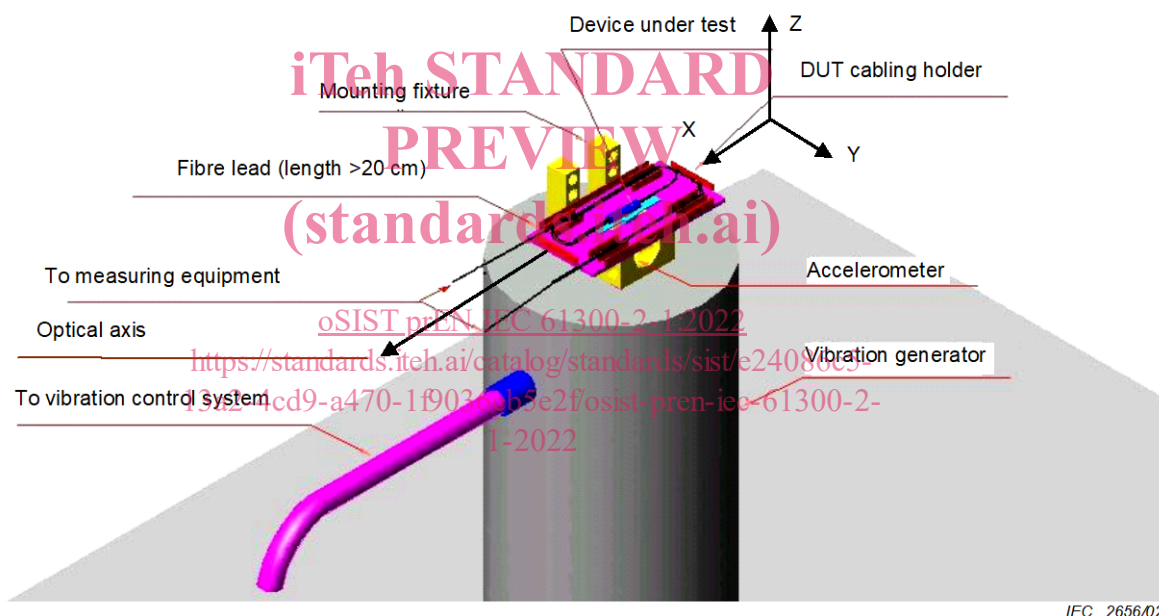
- broken, loose or damaged parts or accessories;
- breaking or damage to the cable jacket, seals, strain relief, or fibres;
- displaced, bent, broken or chipped parts.

6.4 Mounting and test description

The DUT shall be mounted rigidly to the fixture in a manner that simulates normal mounting as closely as possible. Greater than 20 cm of optical fibre/cable shall be unsupported on both ends of the DUT and be attached free of tension to the vibrating surface. Conduct the procedure in accordance with IEC 60068-2-6, test Fc. The DUT shall be vibrated in three mutually perpendicular axes coincident with the principal axes of the device. If the sample has axial symmetry the number of axes to be tested can be reduced to two. The vibration endurance shall be performed by sweeping continuously between minimum and maximum frequency at a specified rate. An example of vibration apparatus test is outlined in Figure 1.

6.5 Monitoring

The transient loss of the DUT shall be monitored during the test using a recording mean such as a computer, oscilloscope or a digital data acquisition system with memory as described in IEC 61300-3-28, unless otherwise specified in the relevant specification. Any change in optical performance shall be within the limit given in the relevant specification.



IEC 2656/02

Figure 1 – Example of vibration apparatus

6.6 Recovery

Allow the DUT to remain under standard atmospheric conditions for more than or equal to 2 h, as defined in IEC 61300-1, unless otherwise specified in the relevant specification.

6.7 Final examination and measurement

On completion of the test, remove all fixtures and make final measurements, as defined by the relevant specification, to ensure that there is no permanent damage to the DUT. The results of the final measurement shall be within the limit established in the relevant specification.

Unless otherwise specified, visually examine the DUT in accordance with IEC 61300-3-1. Check for evidence of any degradation in the DUT. The following are possible examples of degradation:

- broken, loose or damaged parts or accessories;
- breaking or damage to the cable jacket, seals, strain relief, or fibres;
- displaced, bent, broken or chipped parts.

7 Severity

The severity consists of the combination of frequency range, vibration amplitude, sweep rate and either number of sweeps or endurance duration per axis. The severity shall be specified in the relevant specification. Recommended values of the test parameters are given below in Tables 1 through 7 for the various configurations.

Table 1 – Recommended values of the test parameters for connectors and passive components

Category	Parameter	Value
Categories C, C ^{HD} , OP, OP+, OP+ ^{HD} , OP ^{HD} and E	Frequency range	10 Hz to 55 Hz
	Sweep rate	1 oct/min
	Number of sweeps	15/axis
	Amplitude	0,75 mm
Category I, I ^{HD}	Frequency range	2 Hz to 200 Hz
	Sweep rate	1 oct/min
	Number of sweeps	15/axis
	Amplitude	15 mm at frequencies below 9 Hz
Acceleration		50 m/s ² at frequencies above 9 Hz
NOTE Categories are defined in IEC 61753-1		

Table 2 – Recommended values of the test parameters for fibre management systems

Category	Parameter	Value
Categories C, C ^{HD} , OP, OP+, OP+ ^{HD} and OP ^{HD}	Frequency range	5 Hz to 500 Hz
	Sweep rate	1 oct/min
	Number of sweeps	10/axis
	Amplitude	3,5 mm below 9 Hz
	Acceleration	10 m/s ² above 9 Hz
NOTE Categories are defined in IEC 61753-1		

Table 3 – Recommended values of the test parameters for mechanical splices and field mountable connectors

Category	Parameter	Value
Categories C, C ^{HD} , OP, OP+, OP+ ^{HD} and OP ^{HD}	Frequency range	10 Hz to 55 Hz
	Sweep rate	1 oct/min
	Number of sweeps	15/axis
	Amplitude	0,75 mm
NOTE Categories are defined in IEC 61753-1		

Table 4 – Recommended values of the test parameters for wall outlets and optical distribution frame modules

Category	Parameter	Value
Categories C and C ^{HD}	Frequency range	5 Hz to 500 Hz
	Sweep rate	1 oct/min
	Number of sweeps	10/axis
	Amplitude	1,5 mm at frequencies below 9 Hz
	Acceleration	5 m/s ² above 9 Hz
NOTE Categories are defined in IEC 61753-1		

Table 5 – Recommended values of the test parameters for hardened optical connectors

Category	Parameter	Value
Categories A, G, and S	Frequency range	5 Hz to 500 Hz
	Sweep rate	1 oct/min
	Number of sweeps	10/axis
	Amplitude	3,5 mm below 9 Hz
	Acceleration	10 m/s ² above 9 Hz
NOTE Categories are defined in IEC 61753-1		