

# INTERNATIONAL STANDARD



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

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

INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

**FIBRE OPTIC INTERCONNECTING  
DEVICES AND PASSIVE COMPONENTS –  
BASIC TEST AND MEASUREMENT PROCEDURES –****Part 2-1: Tests – Vibration (sinusoidal)****FOREWORD**

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IEC 61300-2-1 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 fourth edition cancels and replaces the third edition published in 2009. This edition constitutes a technical revision.

This edition includes the following significant technical change with respect to the previous edition: harmonizing with the test conditions in IEC 61753-1:2018 and revising severities.

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

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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](http://www.iec.ch/members_experts/refdocs). The main document types developed by IEC are described in greater detail at [www.iec.ch/publications](http://www.iec.ch/publications).

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# 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 ~~may be~~ 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 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 60068-2-6, *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 61300-3-3, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 3-3: Examinations and measurements – Active monitoring of changes in attenuation and return loss*~~

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 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>

### 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 ~~test~~ mounting fixture near the DUT mounting points.

### 5.5 Measuring equipment

~~Unless otherwise specified, measuring equipment specified in IEC 61300-3-3 shall be connected to the DUT for monitoring the optical performances during the test; moreover~~ The transient loss-measuring measurement equipment specified in IEC 61300-3-28 shall be connected to the DUT and used to detect fast variation of attenuation during and after 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 ~~or~~ and as specified in the relevant specification.

### 6.2 Preconditioning

Precondition the DUT for more than or equal to 2 h at the standard ~~test~~ 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 **Conditioning** Mounting and test procedure

The DUT shall be mounted rigidly to the fixture in a manner that simulates normal mounting as closely as possible. ~~A minimum of 200 mm~~ 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.

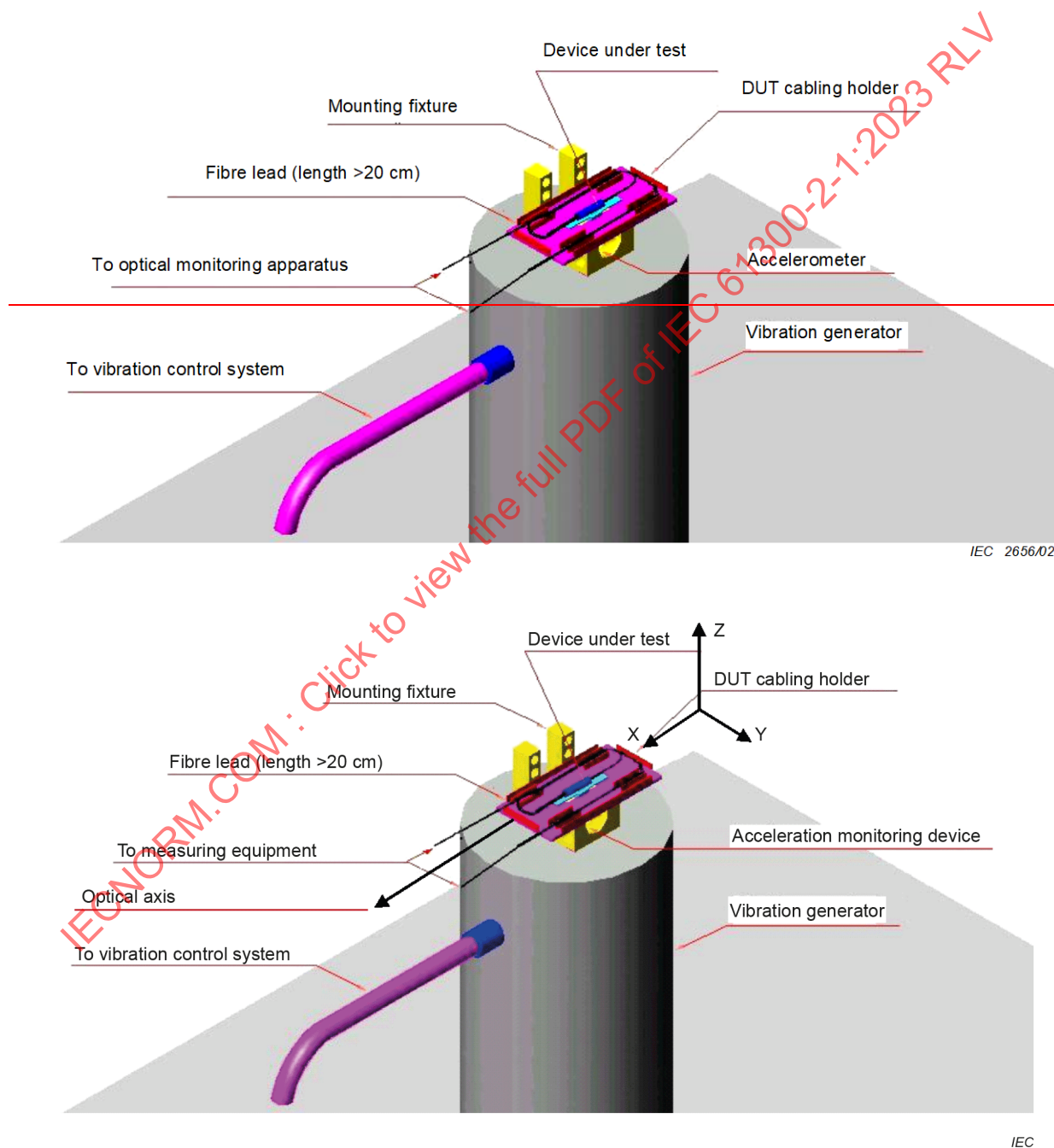


**Figure 1 – Example of vibration apparatus**

## 6.5 Monitoring

The ~~attenuation and/or return~~ transient loss of the DUT shall be monitored during and after the test using ~~an x-y plotter~~, a recording mean such as a computer, oscilloscope or ~~and~~ a digital data acquisition system ~~for recording~~ 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.

## 6.6 Recovery

Allow the DUT to remain under standard ~~test~~ atmospheric conditions for more than or equal to 2 h, as defined in IEC 61300-1, unless otherwise specified in the relevant specification. ~~Clean the DUT in accordance with the manufacturer's instructions.~~

## 6.7 Final examination and measurement

~~On~~ After completion of the test, ~~remove all~~ the DUT shall be removed from the fixtures, and ~~make~~ the final measurements shall be made, 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. ~~This may include, for example~~  
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 ~~Table 1 and 2~~ Table 1 through Table 7 for the various configurations.

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

| Category                                                                        | Parameter                  | Value                                                                    |
|---------------------------------------------------------------------------------|----------------------------|--------------------------------------------------------------------------|
| Categories C, <del>U</del> , C <sup>HD</sup> , OP, OP+, OP+ <sup>HD</sup> and E | Frequency range            | 10 Hz to 55 Hz                                                           |
|                                                                                 | Sweep rate                 | 1 oct/min                                                                |
|                                                                                 | Number of sweeps           | 15/axis                                                                  |
|                                                                                 | Amplitude                  | 0,75 mm                                                                  |
| <del>Category O</del>                                                           | <del>Frequency range</del> | <del>10 Hz—55 Hz</del>                                                   |
|                                                                                 | <del>Sweep rate</del>      | <del>1 oct/min for passive components<br/>45 Hz/min for connectors</del> |
|                                                                                 | <del>Duration</del>        | <del>2 h/axis</del>                                                      |
|                                                                                 | <del>Amplitude</del>       | <del>1,52 mm for passive components<br/>0,75 mm for connectors</del>     |
| Categories I and I <sup>HD</sup>                                                | 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 <sup>2</sup> 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 ~~and closures~~**

| Category                                                                                              | Parameter        | Value                                         |
|-------------------------------------------------------------------------------------------------------|------------------|-----------------------------------------------|
| Categories C, <del>A, G and S</del> C <sup>HD</sup> , OP, OP+, OP+ <sup>HD</sup> and OP <sup>HD</sup> | 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     | <del>9,8</del> 10 m/s <sup>2</sup> 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 <sup>HD</sup> , OP, OP+, OP+ <sup>HD</sup> and OP <sup>HD</sup> | 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 <sup>HD</sup>            | 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 <sup>2</sup> 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 <sup>2</sup> above 9 Hz |
| NOTE Categories are defined in IEC 61753-1. |                  |                                |

**Table 6 – Recommended values of the test parameters for boxes and closures**

| Category                                    | Parameter        | Value                            |
|---------------------------------------------|------------------|----------------------------------|
| Categories C and C <sup>HD</sup>            | 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 <sup>2</sup> above 9 Hz    |
| 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 <sup>2</sup> above 9 Hz   |
| NOTE Categories are defined in IEC 61753-1. |                  |                                  |

**Table 7 – Recommended values of the test parameters for street cabinets**

| Category                                    | Parameter        | Value                            |
|---------------------------------------------|------------------|----------------------------------|
| Category A                                  | Frequency range  | 5 Hz to 500 Hz                   |
|                                             | Sweep rate       | 1 oct/min                        |
|                                             | Number of sweeps | 10/axis                          |
|                                             | Amplitude        | 1,2 mm at frequencies below 9 Hz |
|                                             | Acceleration     | 4 m/s <sup>2</sup> above 9 Hz    |
| NOTE Categories are defined in IEC 61753-1. |                  |                                  |

## 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:

- frequency range;
- vibration amplitude or acceleration;
- number of sweeps or duration per axis;
- ~~– endurance duration per axis;~~
- frequency change ~~at constant~~ (sweep rate);
- initial examinations and measurements and performance requirements;
- examinations and measurements during test and performance requirements;
- final examinations and measurements and performance requirements;
- deviations from this test procedure;
- additional pass/fail criteria.

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## Bibliography

IEC 61753-1:2018, *Fibre optic interconnecting devices and passive components – Performance standard – Part 1: General and guidance*

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# INTERNATIONAL STANDARD

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

**Dispositifs d'interconnexion et composants passifs fibroniques – Procédures fondamentales d'essais et de mesures –  
Partie 2-1: Essais – Vibrations (sinusoïdales)**

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# **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 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 60068-2-6, *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 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>

### **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 and after 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 Preconditioning

Precondition 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

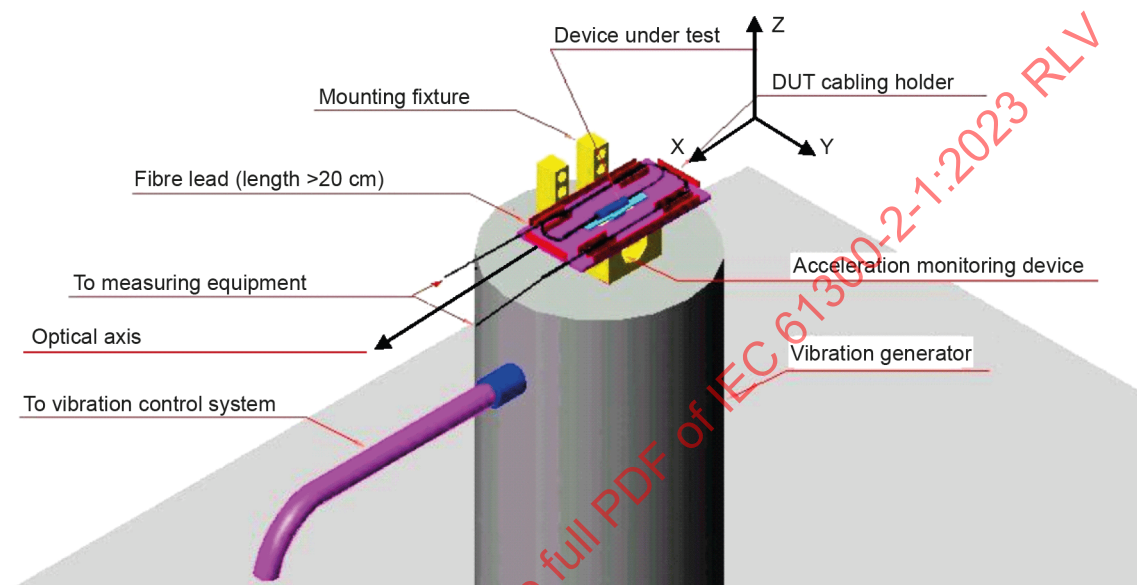
Complete initial examinations and measurements of the DUT as required by the relevant specification.

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 procedure

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.



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Figure 1 – Example of vibration apparatus

## 6.5 Monitoring

The transient loss of the DUT shall be monitored during and after 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.

## 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

After completion of the test, the DUT shall be removed from the fixtures, and the final measurements shall be made, 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 duration per axis. The severity shall be specified in the relevant specification. Recommended values of the test parameters are given below in Table 1 through Table 7 for the various configurations.

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

| Category                                                         | Parameter        | Value                                         |
|------------------------------------------------------------------|------------------|-----------------------------------------------|
| Categories C, C <sup>HD</sup> , OP, OP+, OP+ <sup>HD</sup> and E | Frequency range  | 10 Hz to 55 Hz                                |
|                                                                  | Sweep rate       | 1 oct/min                                     |
|                                                                  | Number of sweeps | 15/axis                                       |
|                                                                  | Amplitude        | 0,75 mm                                       |
| Categories I and I <sup>HD</sup>                                 | 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 <sup>2</sup> 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 <sup>HD</sup> , OP, OP+, OP+ <sup>HD</sup> and OP <sup>HD</sup> | 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 <sup>2</sup> 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 <sup>HD</sup> , OP, OP+, OP+ <sup>HD</sup> and OP <sup>HD</sup> | 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 <sup>HD</sup>            | 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 <sup>2</sup> 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 <sup>2</sup> above 9 Hz |
| NOTE Categories are defined in IEC 61753-1. |                  |                                |

**Table 6 – Recommended values of the test parameters for boxes and closures**

| Category                                    | Parameter        | Value                            |
|---------------------------------------------|------------------|----------------------------------|
| Categories C and C <sup>HD</sup>            | 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 <sup>2</sup> above 9 Hz    |
| 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 <sup>2</sup> above 9 Hz   |
| NOTE Categories are defined in IEC 61753-1. |                  |                                  |

**Table 7 – Recommended values of the test parameters for street cabinets**

| Category                                    | Parameter        | Value                            |
|---------------------------------------------|------------------|----------------------------------|
| Category A                                  | Frequency range  | 5 Hz to 500 Hz                   |
|                                             | Sweep rate       | 1 oct/min                        |
|                                             | Number of sweeps | 10/axis                          |
|                                             | Amplitude        | 1,2 mm at frequencies below 9 Hz |
|                                             | Acceleration     | 4 m/s <sup>2</sup> above 9 Hz    |
| NOTE Categories are defined in IEC 61753-1. |                  |                                  |

## 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:

- frequency range;
- vibration amplitude or acceleration;
- number of sweeps or duration per axis;
- frequency change (sweep rate);
- initial examinations and measurements and performance requirements;
- examinations and measurements during test and performance requirements;
- final examinations and measurements and performance requirements;
- deviations from this test procedure;
- additional pass/fail criteria.

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## Bibliography

IEC 61753-1:2018, *Fibre optic interconnecting devices and passive components – Performance standard – Part 1: General and guidance*

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## COMMISSION ÉLECTROTECHNIQUE INTERNATIONALE

**DISPOSITIFS D'INTERCONNEXION ET  
COMPOSANTS PASSIFS FIBRONIQUES –  
PROCÉDURES FONDAMENTALES D'ESSAIS ET DE MESURES –****Partie 2-1: Essais – Vibrations (sinusoïdales)****AVANT-PROPOS**

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Cette quatrième édition annule et remplace la troisième édition, parue en 2009. Cette édition constitue une révision technique.

Cette édition inclut les modifications techniques majeures suivantes par rapport à l'édition précédente: harmonisation avec les conditions d'essai de l'IEC 61753-1: 2018 et révision des sévérités.

Le texte de cette Norme internationale est issu des documents suivants:

| Projet        | Rapport de vote |
|---------------|-----------------|
| 86B/4692/FDIS | 86B/4724/RVD    |

Le rapport de vote indiqué dans le tableau ci-dessus donne toute information sur le vote ayant abouti à son approbation.

La langue employée pour l'élaboration de cette Norme internationale est l'anglais.

Ce document a été rédigé selon les Directives ISO/IEC, Partie 2, il a été développé selon les Directives ISO/IEC, Partie 1 et les Directives ISO/IEC, Supplément IEC, disponibles sous [www.iec.ch/members\\_experts/refdocs](http://www.iec.ch/members_experts/refdocs). Les principaux types de documents développés par l'IEC sont décrits plus en détail sous [www.iec.ch/standardsdev/publications](http://www.iec.ch/standardsdev/publications).

Une liste de toutes les parties de la série IEC 61300, publiée sous le titre général *Dispositifs d'interconnexion et composants passifs fibroniques – Procédures fondamentales d'essais et de mesures* se trouve sur le site web de l'IEC.

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# DISPOSITIFS D'INTERCONNEXION ET COMPOSANTS PASSIFS FIBRONIQUES – PROCÉDURES FONDAMENTALES D'ESSAIS ET DE MESURES –

## Partie 2-1: Essais – Vibrations (sinusoïdales)

### 1 Domaine d'application

La présente partie de l'IEC 61300 permet d'apprécier les effets des vibrations sur l'affaiblissement des dispositifs fibroniques pour des plages et amplitudes de fréquences prépondérantes qui sont rencontrées pendant l'intervention sur site.

NOTE La plupart des vibrations rencontrées en service ne sont pas de la nature d'une harmonique simple. Cependant, il a été démontré que les essais utilisant des vibrations de ce type conviennent pour simuler les services réels.

### 2 Références normatives

Les documents suivants cités dans le texte constituent, pour tout ou partie de leur contenu, des exigences du présent document. Pour les références datées, seule l'édition citée s'applique. Pour les références non datées, la dernière édition du document de référence s'applique (y compris les éventuels amendements).

IEC 60068-2-6, *Essais d'environnement – Partie 2-6: Essais – Essai Fc: Vibrations (sinusoïdales)*

IEC 61300-1, *Dispositifs d'interconnexion et composants passifs fibroniques – Procédures fondamentales d'essais et de mesures – Partie 1: Généralités et recommandations*

IEC 61300-3-1, *Dispositifs d'interconnexion et composants passifs à fibres optiques – Méthodes fondamentales d'essais et de mesures – Partie 3-1: Examens et mesures – Examen visuel*

IEC 61300-3-28, *Dispositifs d'interconnexion et composants passifs à fibres optiques – Méthodes fondamentales d'essais et de mesures – Partie 3-28: Examens et mesures – Perte transitoire*

### 3 Termes et définitions

Pour les besoins du présent document, les termes et définitions de l'IEC 61300-1 s'appliquent.

L'ISO et l'IEC tiennent à jour des bases de données terminologiques destinées à être utilisées en normalisation, consultables aux adresses suivantes:

- IEC Electropedia: disponible à l'adresse <https://www.electropedia.org/>
- ISO Online browsing platform: disponible à l'adresse <https://www.iso.org/obp>

## 4 Description générale

Cette procédure est dérivée de l'IEC 60068-2-6, essai Fc. Le dispositif en essai (DUT) est monté sur un générateur de vibrations qui le fait vibrer avec un mouvement sinusoïdal. Le DUT est exposé aux vibrations dans trois directions mutuellement perpendiculaires, dont l'une est parallèle à l'axe optique. L'amplitude de vibration est spécifiée soit en matière de déplacement constant, soit en matière d'accélération constante.

## 5 Appareillage

### 5.1 Généralités

L'appareillage doit être conforme à l'IEC 60068-2-6, essai Fc, et se compose des éléments décrits ci-après.

### 5.2 Générateur de vibrations

Générateur de vibrations capable de générer une excitation sinusoïdale et son équipement d'essai auxiliaire.

### 5.3 Dispositif de fixation de montage

Un dispositif de fixation de montage approprié pour le DUT, capable de transmettre les conditions de vibration spécifiées, doit être utilisé. Le dispositif de fixation du montage doit être conçu de façon à ce que les vibrations résonnantes intrinsèques au dispositif de fixation n'aient pas d'effets sur la plage de fréquences spécifiée.

### 5.4 Dispositif de surveillance d'accélération

L'amplitude et l'accélération des vibrations appliquées doivent être surveillées par un dispositif de surveillance de l'accélération, c'est-à-dire un accéléromètre disposé sur le dispositif de montage, près du DUT.

### 5.5 Équipement de mesure

L'équipement de mesure des pertes transitoires spécifié dans l'IEC 61300-3-28 doit être raccordé au DUT et utilisé pour détecter une variation rapide de l'affaiblissement pendant et à l'issue de l'essai, sauf indication contraire dans la spécification applicable.

## 6 Procédure

### 6.1 Préparation des DUT

Préparer les DUT conformément aux instructions du fabricant et selon les indications de la spécification applicable.

### 6.2 Préconditionnement

Préconditionner le DUT pendant 2 h ou plus dans les conditions atmosphériques normales spécifiées par l'IEC 61300-1, sauf indication contraire dans la spécification applicable.

### 6.3 Examen et mesurages initiaux

Mener à bien les mesurages et les examens initiaux sur les DUT comme exigé par la spécification applicable.