

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Fibre optic interconnecting devices and passive components – Basic test and measurement procedures –
Part 2-44: Tests – Flexing of the strain relief of fibre optic devices**

**Dispositifs d'interconnexion et composants passifs à fibres optiques –
Procédures fondamentales d'essais et de mesures –
Partie 2-44: Essais – Flexion du serre-câble des dispositifs à fibres optiques**

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**FIBRE OPTIC INTERCONNECTING DEVICES
AND PASSIVE COMPONENTS –
BASIC TEST AND MEASUREMENT PROCEDURES –****Part 2-44: Tests – Flexing of the strain relief
of fibre optic devices**

FOREWORD

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International Standard IEC 61300-2-44 has been prepared by sub-committee 86B: Fibre optic interconnecting devices and passive components, of IEC technical committee 86: Fibre optics.

This second edition cancels and replaces the first edition published in 2004, and constitutes a technical revision. The specific changes from the previous edition include the diversification of the severity according to environmental categories and component types.

This bilingual version (2013-04) corresponds to the monolingual English version, published in 2008-07.

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

CDV	Report on voting
86B/2541/CDV	86B/2653/RVC

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

The French version of this standard has not been voted upon.

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

A list of all parts of 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 publication will remain unchanged until the maintenance result date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

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- withdrawn,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

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

Part 2-44: Tests – Flexing of the strain relief of fibre optic devices

1 Scope

This part of IEC 61300 specifies a test to determine the influence of a flexing under tensile load of the strain relief of fibre optic devices. The intension is to simulate the number of flexing which would typically be experienced during service. This test is applied to both single fibre cable and multiple fibre cable.

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

3 General description

The device under test is rotated $\pm 90^\circ$ about an axis perpendicular to the axis of the attached cable and in the case of ribbon cable, parallel to the width of the ribbon. This causes a flexing of the strain relief and cable close to the device under test. During the flexing, a tensile force, but no torque, is applied.

4 Apparatus

4.1 General

The apparatus for testing and the flexing patterns involved are presented in Figure 1.

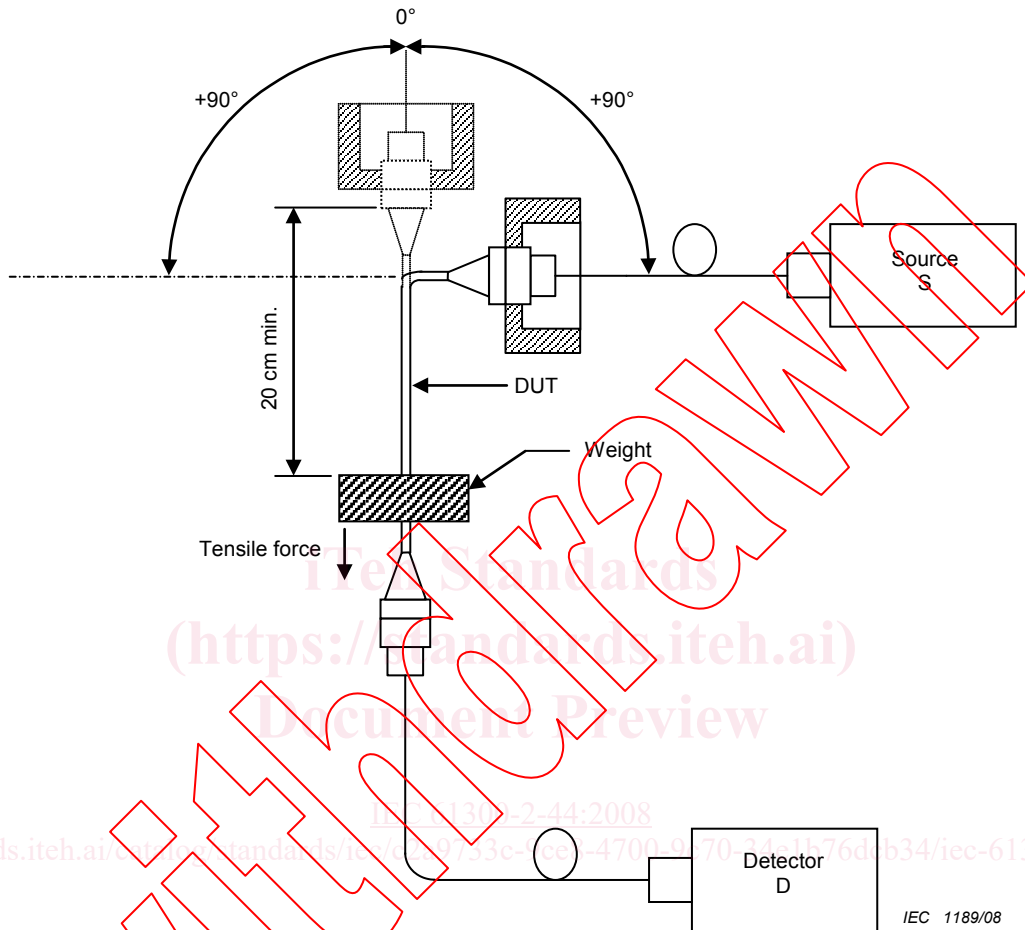


Figure 1a – Overall view of the testing apparatus

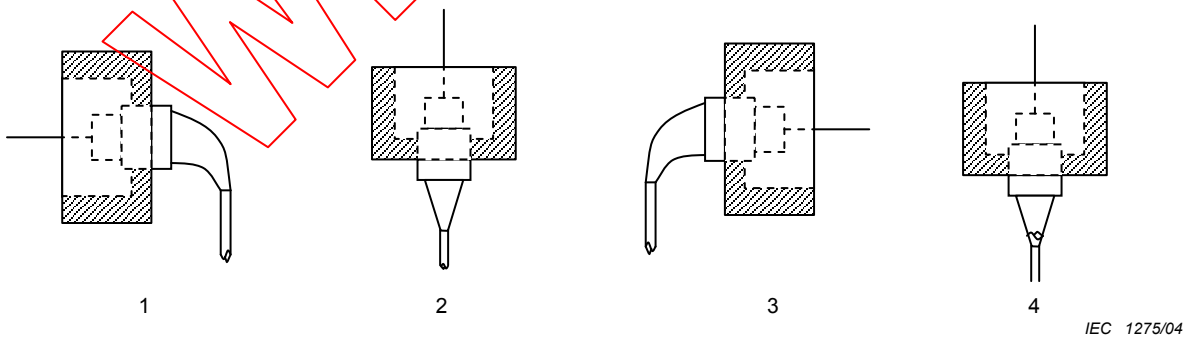


Figure 1b – Flexing patterns

Key

- 1 bending counter-clockwise
- 2 returning to initial position
- 3 bending clockwise
- 4 returning to initial position
- S optical source
- D detector

Figure 1 – Apparatus for testing

In the case of duplex cordage or ribbon, the loads shall not be doubled and the cable shall be bent in the minor axis direction as shown in Figure 2.

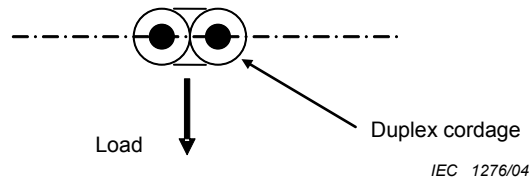


Figure 2 – Application of the load in the case of duplex cordage

The equipment used is that indicated in 4.2 to 4.5.

4.2 Optical source (S)

The recommended source shall be in accordance with IEC 61300-3-3 and IEC 61300-3-4 as appropriate.

4.3 Detector (D)

The recommended detector shall be in accordance with IEC 61300-3-3 and IEC 61300-3-4 as appropriate.

4.4 Mounting fixture

The mounting fixture rigidly holds the fibre optic device under test in correct alignment during the test. If the device is a fibre optic connector, an adaptor or a receptacle may be used as a mounting fixture. The fixture shall not distort the device under test. The fixture shall allow the device under test to be connected to monitoring equipment.

4.5 Flex test machine or jig

A machine or jig that can rotate the DUT $\pm 90^\circ$ from a straight position while applying a load to the fibre or cable.

5 Procedure

5.1 Preparation of specimens

Prepare and clean the specimen in accordance with the manufacturer's instructions.

Visually check (IEC 61300-3-1) that the attachment of the cable to the fibre optic device is not damaged.

Fibre length: 0,2 m to 1 m Details to be specified

5.2 Preconditioning

Pre-condition the specimen and all equipment for 2 h at the standard test conditions as defined in IEC 61300-1, unless otherwise specified in the relevant specification.

5.3 Initial measurements

Complete initial examinations and measurements on the specimen as required by the relevant specification.

5.4 Conditioning

Install the device under test on the apparatus.

Measure the attenuation (IEC 61300-3-4) of the device under test with the flexing arm in a vertical position.

Apply the specified tensile load and apply the specified number of flexes. Use gentle rotational movements, not exceeding 20 cycles/min. The dwell at each extreme shall be not greater than 5 s.

Measure the change in attenuation (IEC 61300-3-3) during test.

Stop the flexing with the flexing arm in vertical position. Remove the tensile force.

5.5 Recovery

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

5.6 Final measurements

Remove the device from the apparatus and make final measurements, as defined by the relevant specification, to ensure that there is no permanent damage to the specimen. The results of the final measurement shall be within the limit established in the relevant specification.

Visually check (IEC 61300-3-1) that the attachment of the cable to the fibre optic device is not damaged.

6 Severity

Severity is specified by the magnitude of tensile force and the number of cycles to the right and left.

Recommended values of the test parameters are given in Table 1:

Table 1 – Severities

Category	Component type	Tensile force N	Number of cycles
C	Connectors - Reinforced cable	2	100
C	Passive components - Reinforced cable	2	30
U and E	Connectors - Reinforced cable	5	100
U and E	Passive components - Reinforced cable	5	30
O	Passive components – Reinforced jacketed cables	5	30
	Primary and secondary coated fibre	2	30
O	Connectors – Reinforced jacketed cables	8,9	100 ^a
	SFF connectors	5,9	100 ^a

^a Applied at 25 ± 3 cm from cable entrance to plug.