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INTERNATIONAL STANDARD

Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 2-5: Tests – Torsion

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

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FOREWORD

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International Standard IEC 61300-2-5 has been prepared by subcommittee 86B: Fibre optic interconnecting devices and passive components, of IEC technical committee 86: Fibre optics.

This third edition cancels and replaces the second edition, published in 2002 and constitutes a technical revision. Specific technical changes from the previous edition are as follows:

– the title was changed;
– the procedure was reconsidered;
– the figure of closure test set-up was added;
– the severity of the test was reconsidered according to the component.

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

FDIS	Report on voting
86B/2774/FDIS	86B/2806/RVD

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

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- withdrawn,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.

A bilingual version of this publication may be issued at a later date.

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

Part 2-5: Tests – Torsion

1 Scope

The purpose of this part of IEC 61300 is to determine the ability of the cable attachment element of the device under test to withstand torsional loads, while under tension, as might be experienced during installation and normal service. The scope of the test also includes those elements designed for ribbon cables.

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 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*

IEC 61300-3-6, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 3-6: Examinations and measurements – Return loss*

3 General description

The cable-to-device interface, while under a specified tension, is subjected to a torsional load or twisting action to determine the effects of this action on the physical and optical properties of the device.

4 Apparatus

4.1 General

The test apparatus shall be capable of applying simultaneously both tension and a torsional load or twisting action to the cable-to-device interface. Figures 1 and 2 show the basic parts of a test apparatus for component and closure test set-ups, respectively.

4.2 Mounting fixture

Use a fixture to rigidly mount the device under test and hold it in proper alignment throughout the test. The fixture shall allow the device under test to be connected to an optical source and detector for monitoring attenuation.

4.3 Cable clamp

The cable clamp is the point at which the torsional load is applied. The cable clamp shall be capable of grasping and securing the cable so that it does not turn or slip in the holder when loads are applied. The clamp shall not crush the optical fibres or cause a change in the attenuation. The cable clamp may consist of a mandrel around which several turns of cable are wrapped and secured.

4.4 Weights

Weights or another mechanism for applying a tensile load to the cable clamp are required. Values of recommended loads are given in Table 1.

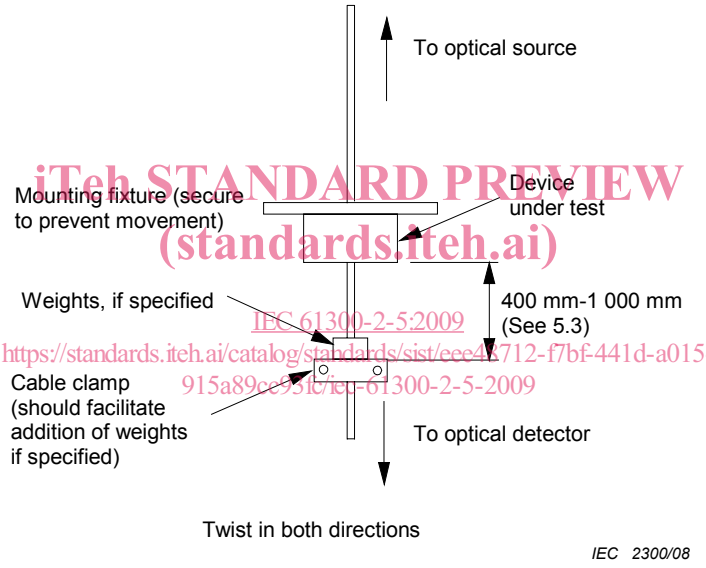

Figure 1 – Component or device test set-up

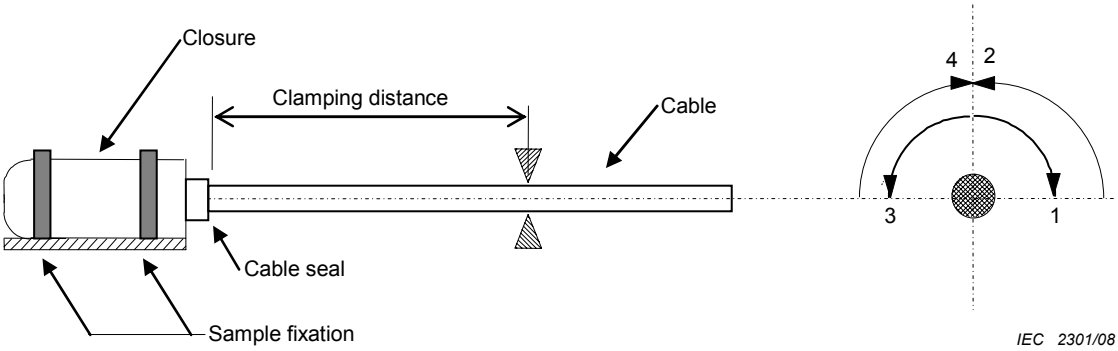

Figure 2 – Closure test set-up

4.5 Optical source and detector

The optical source and detector used to measure changes in attenuation shall comply with that specified in IEC 61300-3-4.

5 Procedure

5.1 Preparation of specimens

Prepare the specimens according to the manufacturer's instructions or as specified in the relevant specification. The device under test shall be terminated onto a sufficient length of fibre cable to facilitate interfacing with the optical source and detector.

5.2 Pre-conditioning

Pre-condition the device under test for 2 h at the standard test conditions specified in IEC 61300-1, unless otherwise specified in the relevant specification. Measure and record the attenuation of the device under test.

5.3 Mount the device under test

The body of the specimen shall be rigidly mounted to a holding plate which is secured in a fixed position (see Figure 1). The clamp to which the load can be applied shall be fastened to the cable in such a manner that the optical fibre or cable is not crushed. The top of the cable clamp shall be 400 mm from the end of the strain relief, if used (see Figure 1). For cable diameters larger than 25 mm, the top of the cable clamp shall be 1 000 mm from the end of the strain relief. If there is no strain relief, the end of the specimen nearest the cable clamp shall be the reference.

5.4 Measure the attenuation

Re-measure the attenuation to ensure that the fixturing and cable clamping have not affected the cable's attenuation.

5.5 Apply cable load

Gradually apply the tensile load, as recommended in Table 1 or as specified in the relevant specification, to the cable clamping fixture, being careful to avoid any sudden jerking or straining of the cable.

5.6 Measure the attenuation

After the load is applied, re-measure the attenuation of the specimen. This value shall be recorded and used as a reference to determine the effects of the twisting motion.

5.7 Twist the cable

Apply a twisting motion to the cable-clamping device, being careful to control the vertical and horizontal motion of the load. One twist cycle shall consist of a twist angle (as indicated in Table 1 or in the relevant specification) in one direction, a return to the original position, a twist angle (as indicatead in Table 1 or in the relevant specification) in the opposite direction and a final return to the original position. Repeat the twist cycle as many times as specified in Table 1, or in the relevant specification.

5.8 Test pressure

For Category S closures, use a test pressure: 40 kPa ± 2 kPa over-pressure at test temperature. For products used in pressurized networks, all testing should be carried out at 98,0 kPa ± 9,8 kPa over-pressure instead of 40 kPa over-pressure.