IEC 61300-2-35

Edition 2.0 2014-03

INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 2-35: Tests – Cable nutation

Dispositifs d'interconnexion et composants passifs à fibres optiques – Procédures fondamentales d'essais et de mesures – Partie 2-35: Essais – Nutation du câble

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

Part 2-35: Tests – Cable nutation

FOREWORD

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International Standard IEC 61300-2-35 has been prepared by subcommittee SC86B: 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 1995, and constitutes a technical revision.

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

– addition of new normative references;
– addition of new terms and definitions;
– addition of two figures for test apparatus: one with horizontal rotation DUT, one with rotating deflection unit;

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– severity reconsidered.

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

FDIS	Report on voting
86B/3703/FDIS	86B/3726/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.

The list of all parts of IEC 61300 series, published under the general title, *Fibre optic interconnecting 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 stability 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

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

Part 2-35: Tests – Cable nutation

1 Scope

This part of IEC 61300 details procedures for determining the suitability of a fibre optic device to withstand nutation that may occur during operation, service, storage and/or transport. The test is intended to indicate the performance of such devices when exposed to torsion and bending as a combined load.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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 Terms and definitions

For the purposes of this document, the terms and definitions contained in the IEC 61300 series, some of which have been repeated here for convenience, and the following terms and definitions apply.

3.1
deflection unit
rotating element with a cable feed through, able to describe a circle without transmitting substantial torque to the cable

3.2
fixed clamping device
clamping device which prevents the device under test (DUT) moving during the test

3.3
fixed plate
plate with a cable feed through able to constrain any movement and twist of the cable in relation to the DUT

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3.4
weight
element which applies the required tensile force to the cable end

3.5
nutation
combined flexing-rotation movements with tensile force

3.6
pulley
swivel pulley

3.7
rotating clamping device
clamping device, able to describe a circle without transmitting axial rotation to the DUT

4 General description

The purpose of environmental testing is to demonstrate that the DUT, under defined environmental conditions, is able to survive without irreversible or reversible failures according to the requirements.

The specimen is placed on the apparatus and subjected to a flexing rotation which is maintained at a given temperature and relative humidity for a specified duration, as specified in the relevant specification.

5 Apparatus

5.1 Design of the apparatus

The apparatus performs a flexing rotation, substantially without torque, of the cable adjacent to the DUT in a conical path, with the axis of the cone being parallel with the longitudinal axis of the specimen. During the rotation a tensile force is applied to the cable. Either the DUT or the deflection unit may rotate, depending on the design of the apparatus. Examples of the test apparatus are given in Figure 1, Figure 2 and Figure 3.

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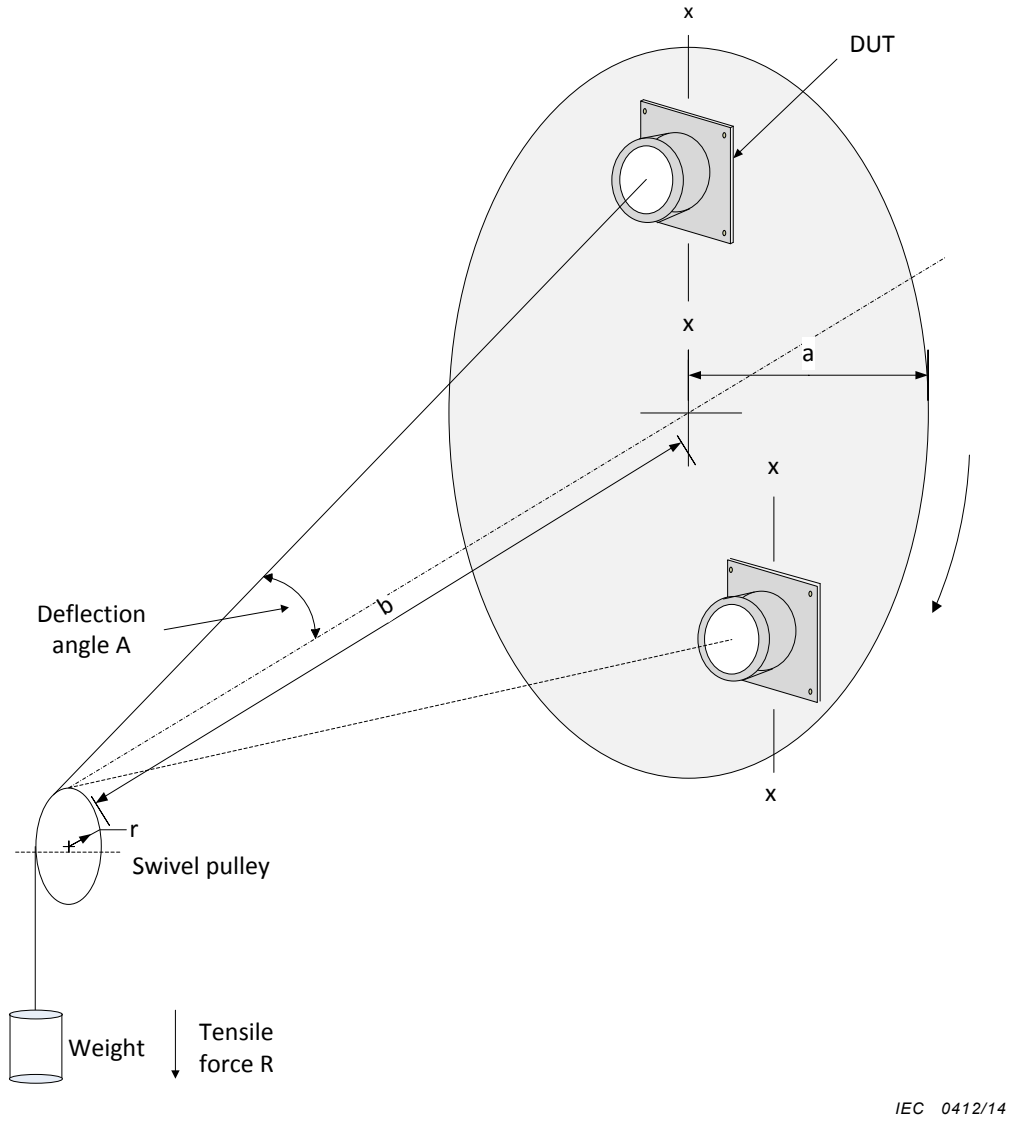

Figure 1 – Test apparatus with vertical rotating DUT

The test apparatus in Figure 1 consists at least of the following elements:

a) rotating clamping device;

b) pulley;

c) weight for the tensile force.

The size of the pulley should not create additional attenuation during the rotation of the connector. The design and size of the pulley should not cause a change in the load at the connector. The maximum radius of the pulley depending on the allowed variation of the cone angle should be calculated with the following equation:

$$r_{max} = \frac{18L}{A\pi}$$

where

L is conical path length;

A is the deflection angle (°) ;

±10% allowable tolerance of conical path length was assumed.

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