SLOVENSKI STANDARD
SIST EN 61300-3-25:1997

01-december-1997

Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 3-25: Examinations and measurements - Concentricity of the ferrules and ferrules with fibre installed (IEC 61300-3-25:1997)

Fibre optic interconnecting devices and passive components - Basic test and measurement procedures -- Part 3-25: Examinations and measurements - Concentricity of the ferrules and ferrules with fibre installed

Lichtwellenleiter - Verbindungselemente und passive Bauteile - Grundlegende Prüf- und Meßverfahren -- Teil 3-25: Untersuchungen und Messungen - Konzentrizität der Stifte und der Stifte mit eingebauter Faser

Dispositifs d'interconnexion et composants passifs à fibres optiques - Méthodes fondamentales d'essais et de mesures -- Partie 3-25: Examens et mesures - Concentricité des embouts et des embouts avec fibre

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EUROPEAN STANDARD

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English version

Fibre optic interconnecting devices and passive components Basic test and measurement procedures Part 3-25: Examinations and measurements Concentricity of the ferrules and ferrules with fibre installed (IEC 61300-3-25:1997)

Dispositifs d'interconnexion et composants passifs à fibres optiques Méthodes fondamentales d'essais et de mesures Partie 3-25: Examens et mesures Concentricité des embouts et des embouts avec fibre (CEI 61300-3-25:1997)

Lichtwellenleiter - Verbindungselemente und passive Bauteile - Grundlegende Prüf- und Meßverfahren Teil 3-25: Untersuchungen und Messungen - Mittigkeit der Stifte und der Stifte mit eingebauter Faser (IEC 61300-3-25:1997)

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European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

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Foreword

The text of document 86B/847/FDIS, future edition 1 of IEC 61300-3-25, prepared by SC 86B, Fibre optic interconnecting devices and passive components, of IEC TC 86, Fibre optics, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 61300-3-25 on 1997-03-11.

The following dates were fixed:

- latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 1997-12-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 1997-12-01

Endorsement notice

The text of the International Standard IEC 61300-3-25:1997 was approved by CENELEC as a European Standard without any modification.

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Dispositifs d'interconnexion et composants passifs à fibres optiques – Méthodes fondamentales d'essais et de mesures –

Partie 3-25: Examens et mesures – Concentricité des embouts et des embouts avec fibre

Fibre optic interconnecting devices and passive components – Basic test and measurement procedures –

Part 3-25: Examinations and measurements – Concentricity of the ferrules and ferrules with fibre installed

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

Part 3-25: Examinations and measurements – Concentricity of the ferrules and ferrules with fibre installed

FOREWORD

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International Standard IEC 61300-3-25 has been prepared by subcommittee 86B: Fibre optic interconnecting devices and passive components, of IEC technical committee 86: Fibre optics.

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

FDIS	Report on voting
86B/847/FDIS	86B/948/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.

IEC 1300 consists of the following parts, under the general title *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures*:

– Part 1: General and guidance
– Part 2: Tests
– Part 3: Examinations and measurements

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

Part 3-25: Examinations and measurements – Concentricity of the ferrules and ferrules with fibre installed

1 General

1.1 *Scope and object*

This part of IEC 1300 describes the procedure to determine the concentricity of the inner diameter of a ferrule relative to the outer diameter, or in the case of ferrules with fibre installed, to determine the concentricity of the fibre core axis with the outer diameter of the ferrule.

1.2 *Normative reference*

The following normative document contains provisions which, through reference in this text, constitute provisions of this part of IEC 1300. At the time of publication, the edition indicated was valid. All normative documents are subject to revision, and parties to agreements based on this part of IEC 1300 are encouraged to investigate the possibility of applying the most recent edition of the normative document indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 2538: 1974, *Limits and fits – Series of angles and slopes on wedges and prisms*

2 General description

This procedure describes the measurement of concentricity of ferrules and ferrules with assembled fibres. Concentricity is defined as twice the distance between the axis of the ferrule and axis of inner diameter of the ferrule (ferrule hole), or in the case of ferrules with fibre installed twice the distance between the axis of the ferrule and the axis of the core of the installed fibre (see figure 1). When concentricity measurements are made with fibre installed the results will be affected by geometry of the fibre and the fit of the fibre in the ferrule inner diameter. Imperfections to cylindricity and circularity of the outside diameter of the specimen will influence the measurement results.

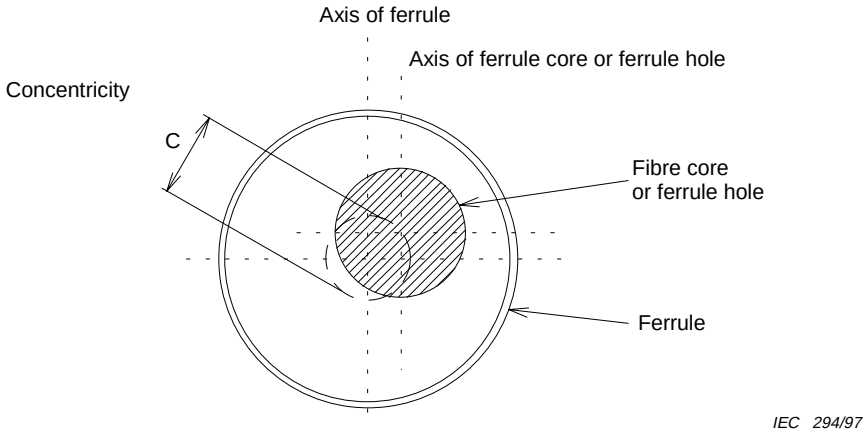

Figure 1 – Definition of concentricity misalignment

Three methods of measuring concentricity are described as follows:

– Method A: ferrule surface reference method (reference test method)

In this method the ferrule or ferrule with fibre installed is placed in a "V-groove" or centring mechanism, and rotated. The displacement of the ferrule inner diameter or fibre core is observed and the concentricity determined.

– Method B: core centre reference method in fibre assembled ferrule

This method uses a roundness measuring instrument to measure concentricity. In this method, the core axis is fixed at the axis of the measuring instrument and the concentricity is determined by measuring, usually with a probe, the displacement of the outer diameter of the ferrule as the ferrule is rotated.

– Method C: ferrule hole reference method for bare ferrule

This method uses a micrometer to measure concentricity. In this method the core centre of the ferrule inner diameter is fixed at the axis of the measuring instrument and the concentricity is determined by measuring, usually with a probe, the displacement of the outer diameter of the ferrule as the ferrule is rotated. This method shall be preferably used for ferrules with multimode fibres.

3 Apparatus

The apparatus consists of the following elements:

3.1 *Method A*

3.1.1 V-groove or centring mechanism (for example air gauge) mounted on a micro-manipulator. According to ISO 2538 the preferred angle for a V-groove is 108°.

3.1.2 Microscope with video camera

3.1.3 Monitor

3.1.4 Light source. A lamp is suitable for this procedure.

3.1.5 Signal processor (optional)

3.2 *Method B*

3.2.1 Roundness measuring instrument with microscope

3.2.2 Light source. A lamp is suitable for this procedure.

3.3 *Method C*

3.3.1 Electric micrometer. The micrometer shall have two tapered spindles to mount the ferrule. The tops of the two spindles shall be aligned precisely to the rotation axis. Roughness of the top of the spindles shall be specified in the detail specification.

4 Procedure

4.1 *Method A*

4.1.1 Clean the ferrule hole thoroughly to assure it is free of dirt, burrs or other obstructions. Place the ferrule in the V-groove or centring mechanism as shown in figure 2.

4.1.2 Illuminate the hole or the fibre.

4.1.3 Position the ferrule in the centre of the target circle on the monitor using the micro-manipulator.

4.1.4 Rotate the ferrule through 180°.

4.1.5 Record the maximum displacement C of the fibre core image of ferrule inner diameter.

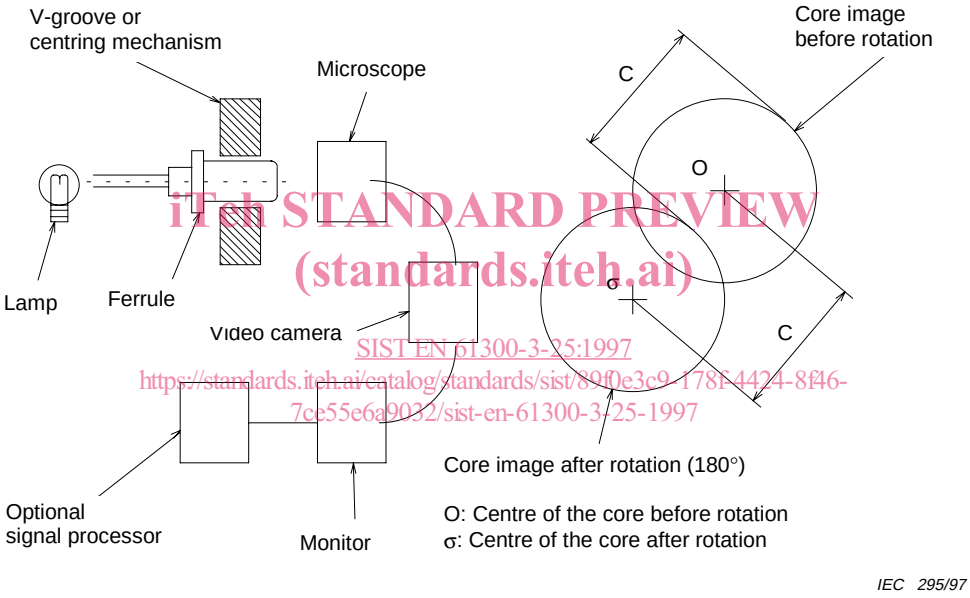

Figure 2 – Example of set-up for concentricity measurement (method A)

4.2 *Method B*

4.2.1 Mount the ferrule assembly on the roundness measuring instrument as shown in figure 3.

4.2.2 Using X-Y table on the roundness measuring instrument, the ferrule position is adjusted so that the fibre core is set exactly at the centre of the rotation axis.

4.2.3 Contact the pick-up of the roundness measuring instrument to the ferrule outer surface so as to measure the displacement of the outer surface of the ferrule as the ferrule is rotated.