SLOVENSKI STANDARD
SIST EN 61300-3-17:2001

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SIST EN 61300-3-17:1999

Fibre optic interconnecting devices and passive componets - Basic test and mesurement procedure - Part 3-17: Examinations and measurements - Endface angle of angle-polished ferrules (IEC 61300-3-17:1999)

Fibre optic interconnecting devices and passive components - Basic test and measurement procedures -- Part 3-17: Examinations and measurements - Endface angle of angle-polished ferrules

Lichtwellenleiter - Verbindungselemente und passive Bauteile - Grundlegende Prüf- und Meßverfahren -- Teil 3-17: Untersuchungen und Messungen - Anschliffwinkel schräg polierter Stifte

Dispositifs d'interconnexion et composants passifs à fibres optiques - Méthodes fondamentales d'essais et de mesures -- Partie 3-17: Examens et mesures - Angle de la face terminale des embouts polis angulairement

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Fibre optic interconnecting devices and passive components Basic test and measurement procedures Part 3-17: Examinations and measurements Endface angle of angle-polished ferrules (IEC 61300-3-17:1999)

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This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

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CENELEC

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/1225/FDIS, future edition 2 of IEC 61300-3-17, 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 61300-3-17 on 1999-10-01.

This European Standard supersedes EN 61300-3-17:1997.

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) 2000-07-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2002-10-01

Endorsement notice

The text of the International Standard IEC 61300-3-17:1999 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 3-17: Examens et mesures – Angle de la face terminale des embouts polis angulairement

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

Part 3-17: Examinations and measurements – Endface angle of angle-polished ferrules

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

Part 3-17: Examinations and measurements – Endface angle of angle-polished ferrules

FOREWORD

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International Standard IEC 61300-3-17 has been prepared by subcommittee 86B: Fibre optic interconnecting devices and passive components, of IEC technical committee 86: Fibre optics.

This second edition of IEC 61300-3-17 cancels and replaces the first edition, published in 1995, and constitutes a technical revision.

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

FDIS	Report on voting
86B/1225/FDIS	86B/1261/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 3.

IEC 61300 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: Examination and measurements

The committee has decided that the contents of this publication will remain unchanged until 2006. 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 3-17: Examinations and measurements – Endface angle of angle-polished ferrules

1 General

1.1 Scope and object

The object of this part of IEC 61300 is to describe the methods to measure the endface angle of flat or convex angle-polished ferrules.

1.2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of IEC 61300. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of IEC 61300 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 2538:1998, *Geometrical Product Specifications (GPS) – Series of angles and slopes on prisms*

2 General description

The ferrule endface angle θ for flat endface angle-polished ferrules is defined as the angle between the plane perpendicular to the axis of the ferrule and the plane of the flat endface. The endface angle θ for spherically polished angled endface ferrules is the angle between the plane perpendicular to the axis of the ferrule and the straight line tangent to the polished surface at the fibre core in the direction of the nominal angle (see figure 1).

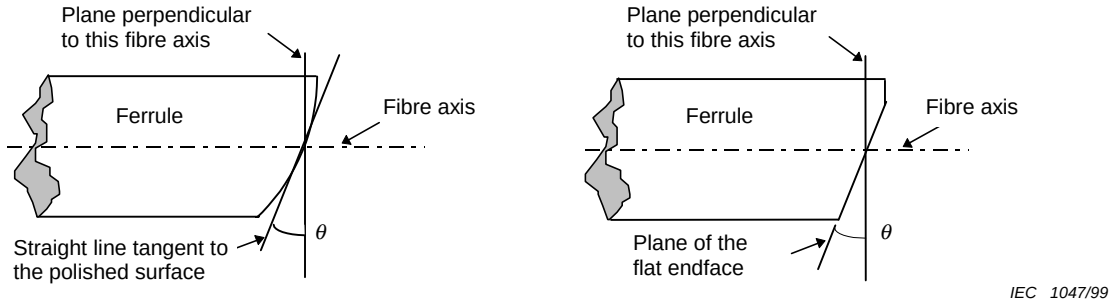

Figure 1a – Convex polished ferrules

Figure 1b – Flat polished ferrules

Figure 1 – Definition of ferrule endface angle for convex and flat polished ferrules

Four methods are described for measuring the ferrule endface angle:

– method 1: automatic interferometric method (reference method);
– method 2: manual interferometric method;
– method 3: mechanical profilometer method;
– method 4: reflected light method.

2.1 Method 1 – Automatic interferometric method

Due to its greater accuracy, method 1 is considered to be the reference method.

In this method, the ferrule endface is placed in a tiltable micropositioner under a microscope with interferometric capability.

NOTE – A fixed holder at the nominal value of the angle that has to be measured may be used, but in this case the alignment procedure described is not applicable and it is necessary to use a reference angled plug measured with other methods.

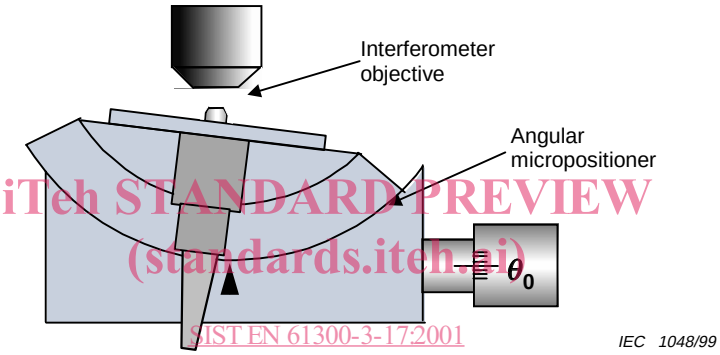

Figure 2 – Example of set-up of angle measurement by means of interferometer

Phase differences between the reference wavefront and the wavefront from the surface of the ferrule under test create a fringe pattern.

The ferrule is tilted by a micropositioner at the nominal value θ_0 of the angle that has to be measured. For a convex polished ferrule, the curvature radius R and the apex offset component in the direction of the angle E_x are measured from the analysis of the interferometric pattern (see figure 3). The value of the angle is evaluated from the values of R and E_x.

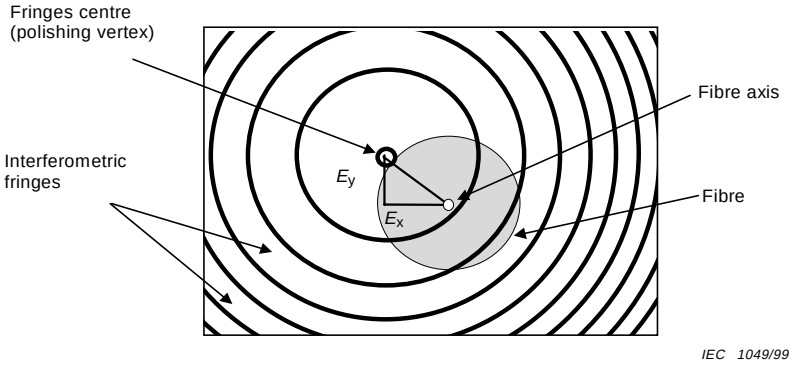

Figure 3 – Example of interference pattern of a convex polished ferrule

For a flat polished ferrule, the angle is evaluated from the frequency of the interferometric fringes in the angle direction (see figure 4), that is, from the number of waves in the length unit $1/\Lambda$.

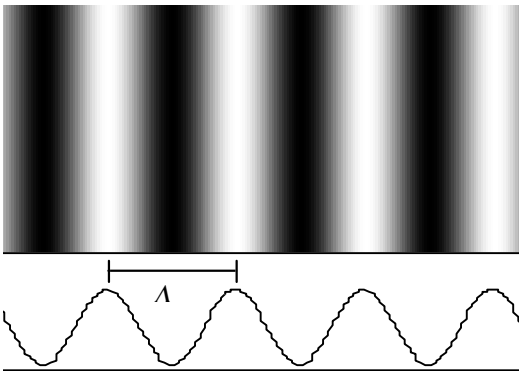

Figure 4 – Example of interference pattern of a flat polished ferrule

2.2 Method 2 – Manual interferometric method

As in method 1, the ferrule endface is placed in a tiltable micropositioner under a microscope with interferometric capability. In this method, however, the ferrule is tilted by a micro-positioner until the surface of the endface is normal to the optical axis of the interferometer: this happens when the real value of the angle is reached. In the case of a convex polished ferrule endface, this position is reached when the interference rings and the fibre are both symmetrical to the rotation axis (see figure 5). In the case of a flat polished ferrule, this position is reached when the interference fringes disappear or are at a minimum number.

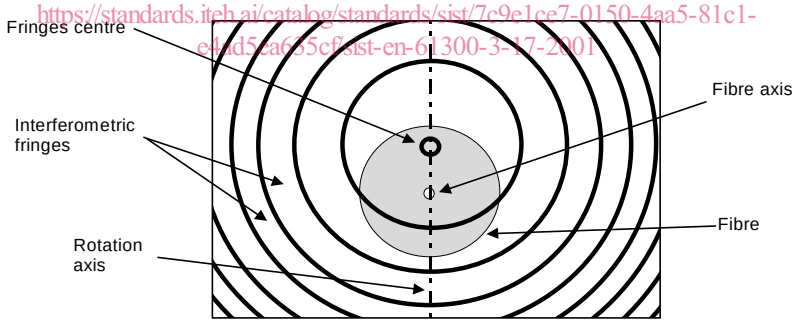

Figure 5 – Example of interference pattern of a convex polished ferrule adjusted for method 2 measurement

The endface angle of the ferrule can be read at the dial of the micropositioner.

2.3 Method 3 – Mechanical profilometer method

In this method, the endface angle is evaluated by profiling the endface ferrule with a surface analyser.

The ferrule is placed in a fixed holder under the stylus of mechanical profilometer. The ferrule axis shall be parallel to the stylus axis and the plug shall be positioned with the angle in the direction of the stylus scan.

The endface angle of the ferrule is evaluated from the analysis of the acquired profile.