SLOVENSKI STANDARD
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Optični spojni elementi in pasivne komponente - Postopki osnovnega preskušanja in meritev- 3-30. del: Preiskave in meritve - Geometrija čela za pravokotne tulce (IEC 61300-3-30:2020)

Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 3-30: Examinations and measurements - Endface geometry of rectangular ferrule (IEC 61300-3-30:2020)

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Lichtwellenleiter - Verbindungselemente und passive Bauteile - Grundlegende Prüf- und Messverfahren - Teil 3-30: Untersuchungen und Messungen - Endflächen-Geometrie einer rechteckigen Ferrule (IEC 61300-3-30:2020)

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European foreword

The text of document 86B/4357/FDIS, future edition 2 of IEC 61300-3-30, 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 approved by CENELEC as EN IEC 61300-3-30:2021.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2021-10-18
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2024-01-18

This document supersedes EN 61300-3-30:2003 and all of its amendments and corrigenda (if any).

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NORME INTERNATIONALE

Fibre optic interconnecting devices and passive components – Basic test and measurement procedures –
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FIBRE OPTIC INTERCONNECTING DEVICES AND PASSIVE COMPONENTS – BASIC TEST AND MEASUREMENT PROCEDURES –

Part 3-30: Examinations and measurements – Endface geometry of rectangular ferrule

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International Standard IEC 61300-3-30 has been prepared by subcommittee 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 2003. This edition constitutes a technical revision.

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

a) measurement of the individual fibre tip radii;
b) introduction of the geometry limit (GL) metric;
c) introduction of the minus coplanarity metric;
d) new method for measuring the core dips;
e) all measurement regions are now identical for MM and SM fibres;

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f) the ferrule surface angle sign convention has been changed.

The text of this International Standard is based on the following documents:

FDIS	Report on voting
86B/4357/FDIS	86B/4378/RVD

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

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

A list of all parts in the 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 document will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific document. At this date, the document will be

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

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

Part 3-30: Examinations and measurements – Endface geometry of rectangular ferrule

1 Scope

This part of IEC 61300 describes a method of measuring the end face geometry of rectangular multifibre ferrules having an IEC defined optical interface. The primary attributes are fibre position relative to the end face, either withdrawal or protrusion, end face angle relative to the guide pin bores, fibre tip radii and core dip for multimode fibres.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

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No terms and definitions are listed in this document.

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ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at http://www.electropedia.org/
- ISO Online browsing platform: available at http://www.iso.org/obp

4 General description

Guide pin based multifibre connector plugs typically have a rectangular end face with a long axis and a short axis. Ideally, a flat polish is desired on the end face with the fibres protruding slightly and all in the same plane to assure physical contact of the fibre cores when two connectors are intermated. In practice, the end face typically has two different curvatures across the surface along the long and short axis. Since mated ferrules are aligned by pins in the guide holes, the end face of the ferrule shall be properly oriented (S_x and S_y angles) with respect to the guide holes to achieve positive contact. The end face angle S_x in the x axis and the end face angle S_y in the y axis are measured by finding the best fit plane based on a percentage of the highest points in a specified region of interest. The highest points typically show the greatest modulation from an interferometric standpoint. This allows for more robust measurements and greater repeatability between different interferometers.

The angle of the best fit plane is calculated by comparing it to the reference plane which is perpendicular to the axis of each guide hole. The height H (positive is a protrusion) of the fibres is a planar height defined as the distance between the fibre end face and the best fit plane. Core dip is of more relevance to multimode fibres because the large core is softer than the cladding of the fibre and tends to polish away faster. Core dip is calculated using the paraboloid method described in Annex E.

One method is described for measuring polish angle and fibre position for a single ferrule multifibre connector by analysing the endface with a three-dimensional interferometry type surface analyser.

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5 Measurement regions

The following regions shall be defined on the ferrule end face.

a) Region of interest (ROI): the ROI is set on the ferrule surface and defined by a rectangular region having a long axis (x axis) of length, L, and a short axis (y axis) of height, H. The region of interest is chosen to cover the intended contact zone of the ferrule end face when the ferrules are mated. The region of interest shall be centred on the fibre array. See Figure 1. Refer to Table 1 for measurement areas to be used for different connectors.

b) Extracting region*:* the extracting region, which includes the fibre end face regions and the associated adhesive regions, is defined by circles having a diameter E, centred on each fibre;

c) Averaging region*:* the averaging region is set on the fibre surfaces to be used to calculate the fibre height, and is defined by a circle having a diameter F. The averaging region is the same for singlemode (SM) fibres and multimode (MM) fibres.

d) Core dip region*:* the core dip region is set on the fibre surfaces to be used to calculate the fibre core-dip using the paraboloid method, and is defined by circles having a diameter CD, centred on each fibre.

Core dip adjustment constant*:* the calculated core dip amplitude following the fit of a paraboloid function to the fibre endface is adjusted by means of constant R_1.

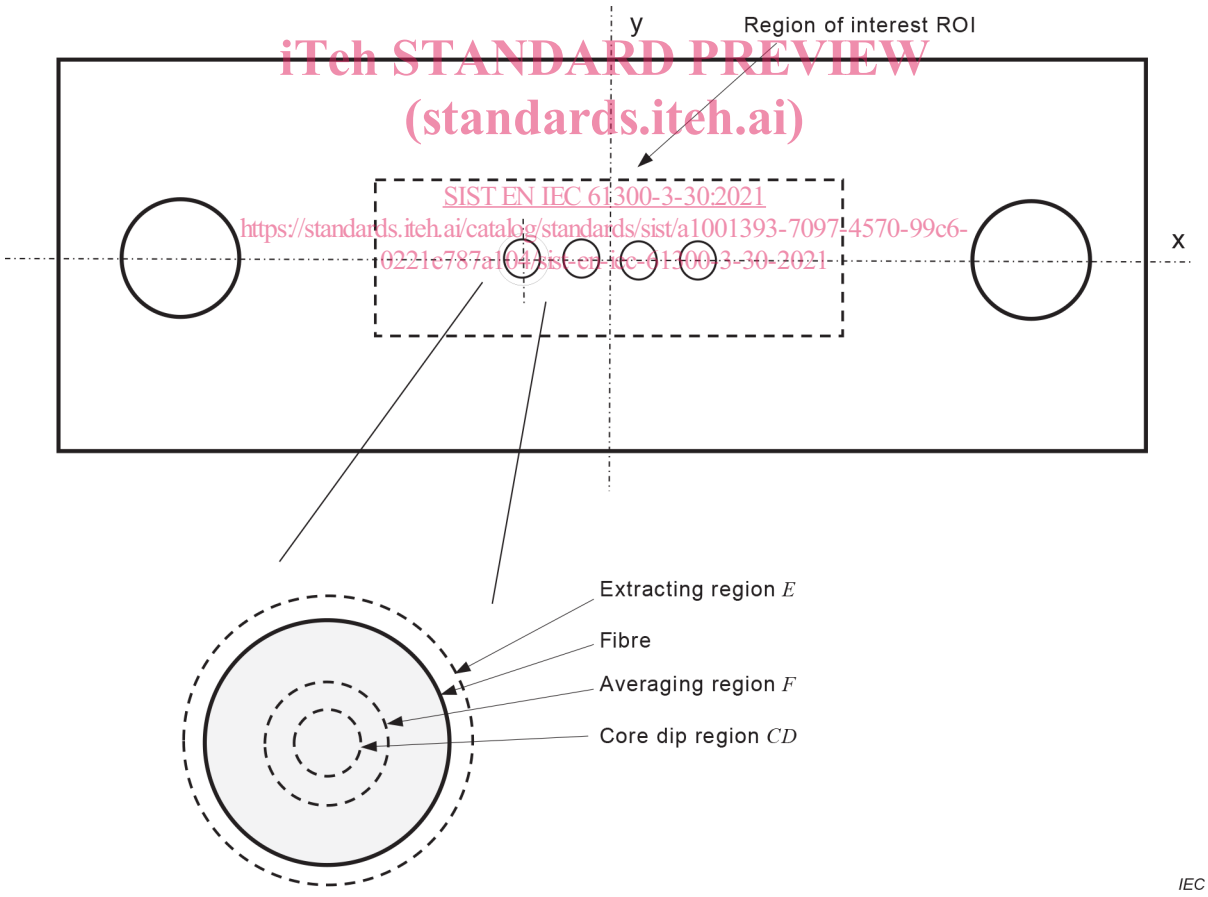

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Figure 1 – Measurement regions on ferrule and fibre