SLOVENSKI STANDARD
oSIST prEN IEC 61300-3-30:2025

01-marec-2025

Optični spojni elementi in pasivne komponente - Postopki osnovnega preskušanja in meritev- 3-30. del: Preiskave in meritve - Geometrija čela za pravokotne tulce

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

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

Dispositifs d'interconnexion et composants passifs fibroniques - Procédures fondamentales d'essais et de mesures - Partie 3-30: Examens et mesures - Géométrie de la surface de terminaison de la ferrule rectangulaire

Ta slovenski standard je istoveten z: **prEN IEC 61300-3-30:2025**

ICS:

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86B/4981/CDV

COMMITTEE DRAFT FOR VOTE (CDV)

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IEC SC 86B : FIBRE OPTIC INTERCONNECTING DEVICES AND PASSIVE COMPONENTS	
SECRETARIAT: Japan	SECRETARY: Mr Ryo Koyama
OF INTEREST TO THE FOLLOWING COMMITTEES:	HORIZONTAL FUNCTION(S):
ASPECTS CONCERNED:	
☒ SUBMITTED FOR CENELEC PARALLEL VOTING **Attention IEC-CENELEC parallel voting** The attention of IEC National Committees, members of CENELEC, is drawn to the fact that this Committee Draft for Vote (CDV) is submitted for parallel voting. The CENELEC members are invited to vote through the CENELEC online voting system.	☐ NOT SUBMITTED FOR CENELEC PARALLEL VOTING

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TITLE:

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

PROPOSED STABILITY DATE: 2032

NOTE FROM TC/SC OFFICERS:

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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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 third edition cancels and replaces the second edition published in 2020. This edition constitutes a technical revision.

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

a) clarification of region diameter symbols;
b) introduction of x116 and x132 ROI to support MT-16 and MT-32 ferrule types;
c) preparation of GL parameters tables for 16, 24 and 32-fibre ferrules;
d) clarification of the neighbouring fibres definition when computing adjacent height;

e) improvement of figures in Annexes.

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

FDIS	Report on voting
86B/XX/FDIS	86B/XX/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*, 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.

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

The National Committees are requested to note that for this document the stability date is 2024.

THIS TEXT IS INCLUDED FOR THE INFORMATION OF THE NATIONAL COMMITTEES AND WILL BE DELETED AT THE PUBLICATION STAGE.

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 for measuring the endface geometry of rectangular multifibre ferrules having an IEC defined optical interface. The primary attributes are fibre position relative to the endface, endface angle relative to the guide holes, fibre tip radii and core dip for multimode fibres.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

No terms and definitions are listed in this document.

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

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

4 General description

Guide pin based multifibre connector plugs typically have a rectangular endface with a long axis and a short axis. Ideally a flat polish is desired on the endface 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 endface 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 endface of the ferrule shall be properly oriented (SX and SY angles) with respect to the guide holes to achieve positive contact. The endface angle SX in the long axis (X-axis) and the endface angle SY in the short axis (Y-axis) (as defined in Annex B) are measured by finding the best fit plane (P_J), 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 P_J is calculated by comparing it to the reference plane P which is perpendicular to the averaged axis of the guide holes. The height H (positive is a protrusion) of the fibres is a planar height defined as the distance between the fibre endface 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 the polish angle and fibre position for a single ferrule multifibre connector by analysing the endface with a three-dimensional interferometry type surface analyser.

5 Measurement regions

The following regions shall be defined on the ferrule endface.

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) and a short axis (Y-axis). The region of interest is chosen to cover the intended contact zone of the ferrule endface 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 endface regions and the associated adhesive regions, is defined by circles having a diameter $Ø_E$, 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 $Ø_F$. The averaging region is the same for single-mode (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 $Ø_{CD}$, centred on each fibre.

Additionally, 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.

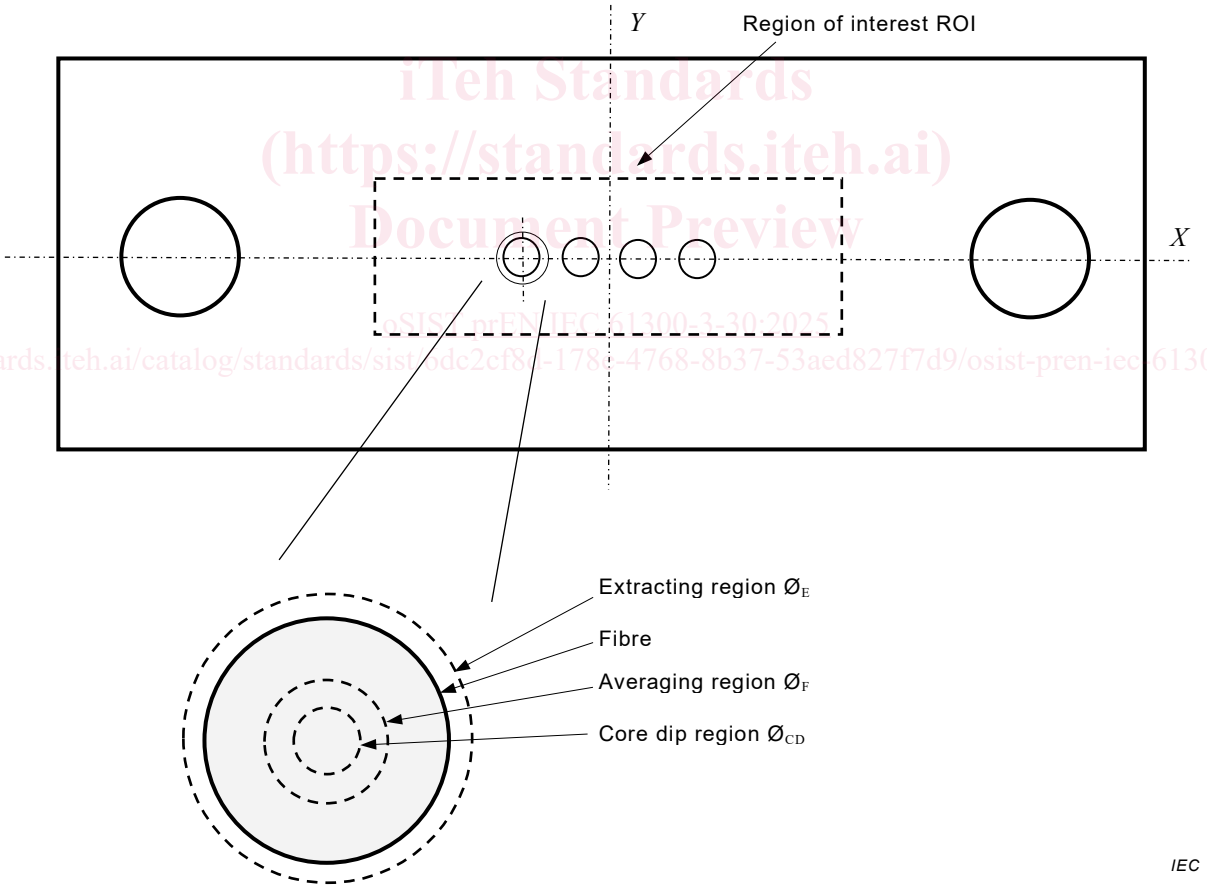

Figure 1 – Measurement regions on ferrule and fibre

Table 1 – Ferrule measurement areas and parameters

Ferrule type (variant number)	Descrip-tion	Region of interest-*ROI* (*X* × *Y*) mm × mm	% top pixels excluded	Next % top pixels used	Extracting region (diameter $Ø_E$) mm	Averaging region-SM+MM (diameter $Ø_F$) mm	Core dip fitting region (diameter $Ø_{CD}$) mm	Core dip adjustment constant R_1 (see Annex E)
x104	MT-04	2,900 × 0,675	3	20	0,140	0,05	0,03	0,03
x108	MT-08	2,900 × 0,675	3	20	0,140	0,05	0,03	0,03
x112	MT-12	2,900 × 0,675	3	20	0,140	0,05	0,03	0,03
x116	MT-16	3,900 × 0,675	3	20	0,140	0,05	0,03	0,03
x124	MT-24	2,900 × 1,160	3	20	0,140	0,05	0,03	0,03
x132	MT-32	3,900 × 1,160	3	20	0,140	0,05	0,03	0,03
1002	MiniMT	0,900 × 0,675	3	20	0,140	0,05	0,03	0,03
NOTE The x defines 1 for Poly Phenylene Sulfide Resin (PPS) ferrule materials and 2 for thermoset materials; the second digit represents 2,45 mm x 4,4 mm with 0 and 2,45 mm x 6,4 mm with 1; and the last two digits designates the number of fibres (see Table 1 of IEC 61755-3-31:2015 and IEC 61755-3-32:2015).								

6 Apparatus

6.1 General

The apparatus shown in Figure 2 consists of a positioning stage, a ferrule holder, an interferometric video microscope, a PC based fringe interpretation unit and a monitor to view the ferrule endface interferogram and display the analysis results.

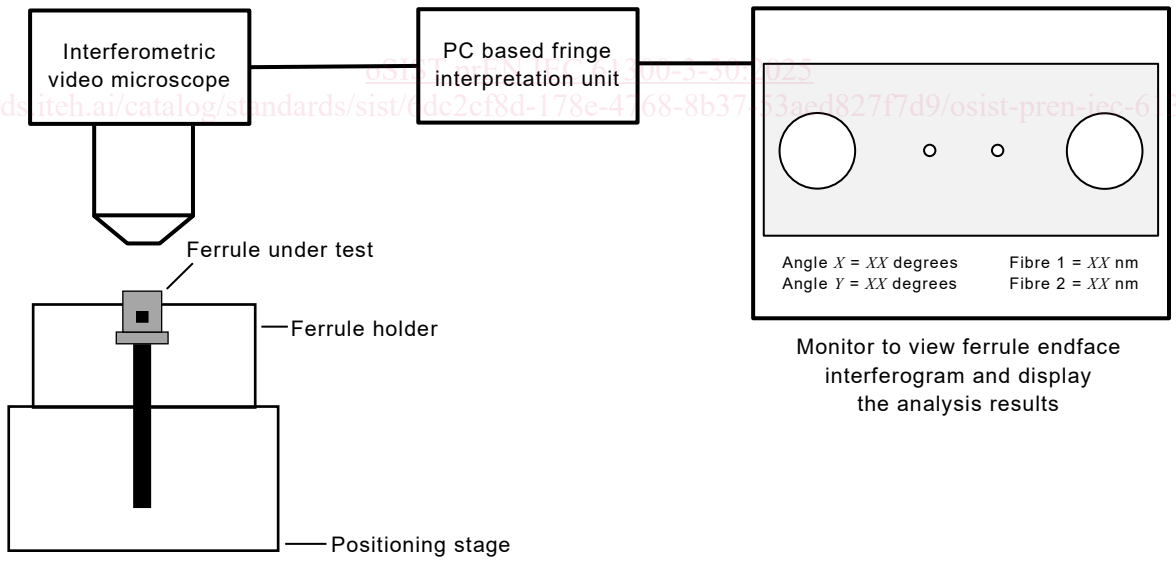

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Figure 2 – Measurement setup

6.2 Ferrule holder

The ferrule holder is a suitable device to hold the ferrule in a fixed position, either vertical or horizontal, or in a tilted position in the case of an angled ferrule type. Methods such as mechanical alignment or interferometric measurement shall be used to determine the axis of each guide hole and the average plane perpendicular to the guide hole axes. This plane shall be considered as the reference plane P for reference to subsequent calculations.