SLOVENSKI STANDARD
SIST EN 61300-3-23:1999

01-maj-1999

Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 3-23: Examination and measurements - Fibre position relative to ferrule endface (IEC 61300-3-23:1998)

Fibre optic interconnecting devices and passive components - Basic test and measurement procedures -- Part 3-23: Examination and measurements - Fibre position relative to ferrule endface

Lichtwellenleiter - Verbindungselemente und passive Bauteile - Grundlegende Prüf- und Meßverfahren -- Teil 3-23: Untersuchungen und Messungen - Lage der Faser bezogen auf die Stiftendfläche

Dispositifs d'interconnexion et composants passifs à fibres optiques - Méthodes fondamentales d'essais et de mesures -- Partie 3-23: Examens et mesures - Position de la fibre par rapport à l'extrémité de l'embout

Ta slovenski standard je istoveten z: **EN 61300-3-23:1998**

ICS:

33.180.20	Povezovalne naprave za optična vlakna	Fibre optic interconnecting devices

SIST EN 61300-3-23:1999 **en**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 61300-3-23

August 1998

ICS 33.180.20

English version

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(IEC 61300-3-23:1998)

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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

Ref. No. EN 61300-3-23:1998 E

Foreword

The text of document 86B/1056/FDIS, future edition 1 of IEC 61300-3-23, 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 61300-3-23 on 1998-08-01.

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) 1999-05-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2001-05-01

Endorsement notice

The text of the International Standard IEC 61300-3-23:1998 was approved by CENELEC as a European Standard without any modification.

NORME INTERNATIONALE

INTERNATIONAL STANDARD

CEI
IEC
61300-3-23

Première édition
First edition
1998-04

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

Partie 3-23: Examens et mesures – Position de la fibre par rapport à l'extrémité de l'embout

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

Part 3-23: Examinations and measurements – Fibre position relative to ferrule endface

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Commission Electrotechnique Internationale
International Electrotechnical Commission
Международная Электротехническая Комиссия

CODE PRIX
PRICE CODE Q

Pour prix, voir catalogue en vigueur
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FOREWORD

1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, the IEC publishes International Standards. Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. The IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.

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International Standard IEC 61300-3-23 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/1056/FDIS	86B/1083/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.

Annex A is for information only.

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

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

Part 3-23: Examination and measurements – Fibre position relative to ferrule endface

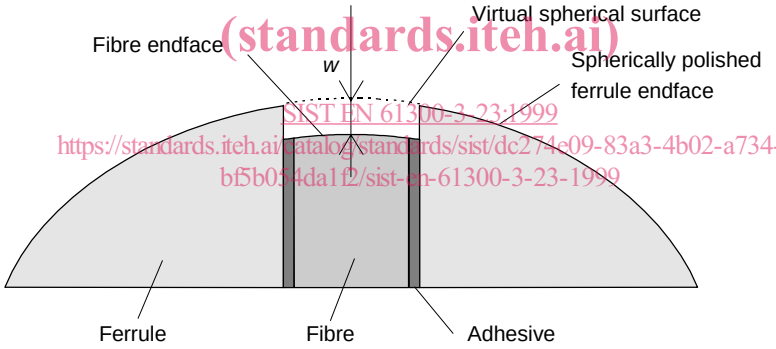
1 General

1.1 Scope and object

The purpose of the procedure described this part of IEC 61300 is to measure the fibre position relative to the ferrule endface of a spherically polished ferrule, that is a fibre undercut or a fibre protrusion.

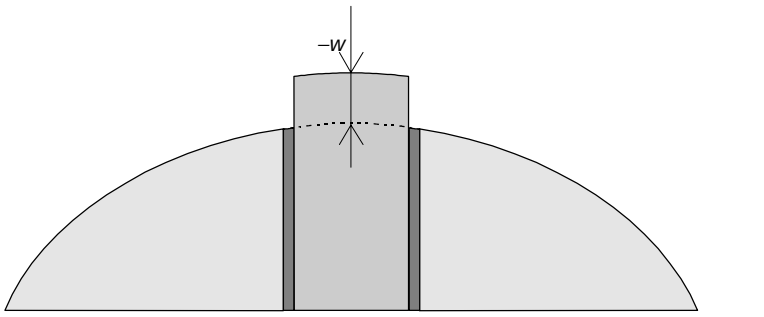
1.2 General description

The fibre undercut $+w$ or protrusion $-w$ of a spherically polished ferrule is defined as the average distance between a fibre endface and a virtual spherical surface which is fitted to the spherically polished ferrule endface. It is assumed that a circle region of the ferrule endface, which is centred to the ferrule axis, is spherical, although in practice the endface is often aspherical.



IEC 502/98

Figure 1a - Fibre undercut $+w$



IEC 503/98

Figure 1b - Fibre protrusion $-w$

Figure 1 – Fibre undercut and protrusion of spherically polished ferrule endface

Three methods are described in this standard for measuring the fibre undercut or protrusion:

a) method 1: analyzing the endface with a two-dimensional surface analyzer;

b) method 2: analyzing the endface with a three-dimensional interferometry type surface analyzer;

c) method 3: analyzing the endface with a two-dimensional interferometry type surface analyzer.

Method 1 is the reference method.

2 Apparatus

2.1 Method 1 – Two-dimensional surface analysis

The apparatus shown in figure 2 consists of a suitable ferrule holder, a positioning stage and a two-dimensional surface analyzer.

2.1.1 Ferrule holder

The ferrule holder is a suitable device to hold the ferrule in a fixed vertical position, or in a tilted position in the case of an angled ferrule type.

2.1.2 Positioning stage

The ferrule holder is fixed to the positioning stage, which shall enable the holder to be moved to the appropriate position. The stage shall have enough rigidity so as to measure the ferrule endface with a precision of some nanometres.

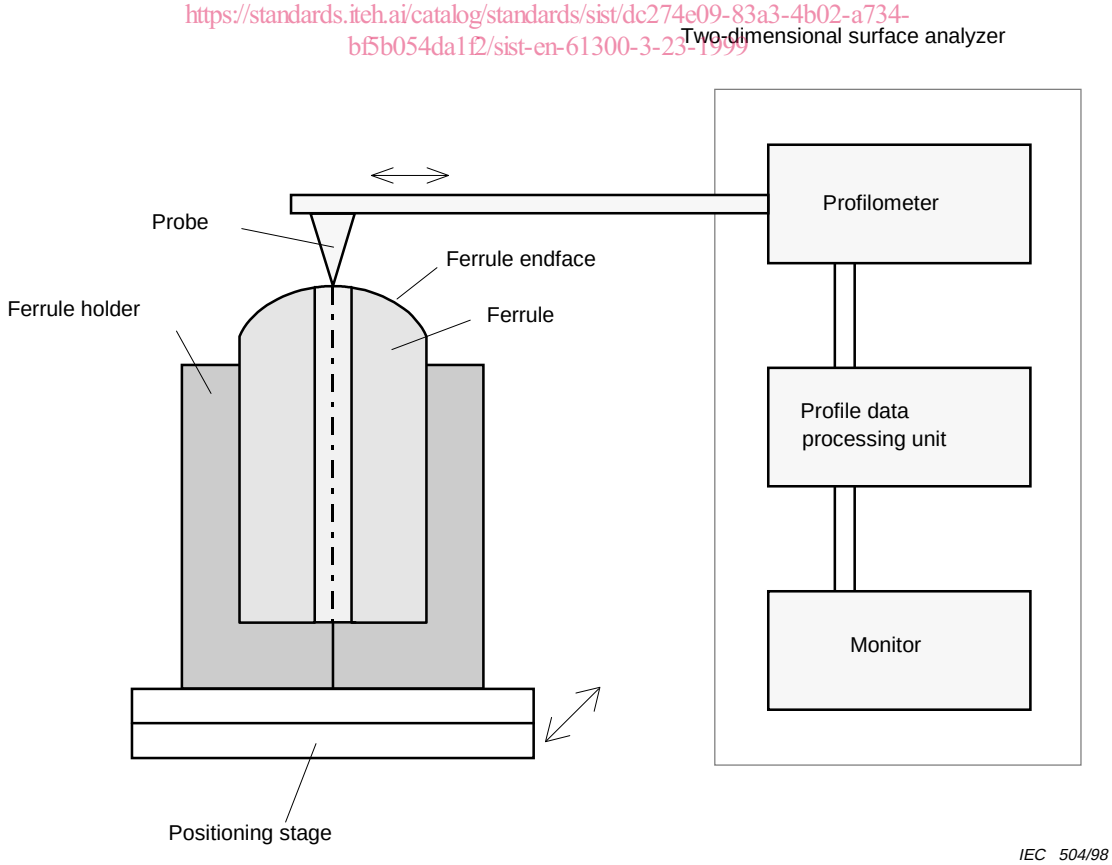


Figure 2 – Apparatus for two-dimensional surface analysis

2.1.3 Two-dimensional surface analyzer

The two-dimensional surface analyzer shall have an ability to measure the profile of the ferrule endface with an accuracy better than ±10 nm. The analyzer shall consist of a profilometer, a profile data processing unit and a monitor.

The profilometer shall be equipped with a wedge type probe arranged so that the motion of the trace is perpendicular to the ferrule axis.

The profile data processing unit shall be able to process the profile data so as to measure the fibre undercut or protrusion: the unit calculates an ideal circle fitted to the spherical ferrule endface from the measured profile data and calculates converted data from the measured profile data by extracting the ideal circle data.

The monitor shall display the measured and calculated profiles.

2.2 Method 2 – Three-dimensional surface analysis by interferometry system

The apparatus shown in figure 3 consists of a suitable ferrule holder, a positioning stage and a three-dimensional interferometry analyzer.

2.2.1 Ferrule holder

The ferrule holder is a suitable device to hold the ferrule in a fixed vertical position, or in a tilted position in the case of an angled ferrule type.

2.2.2 Positioning stage

The ferrule holder is fixed to the positioning stage, which shall enable the holder to be moved to the appropriate position. The stage shall have enough rigidity so as to measure the ferrule endface with a precision of some nanometres.

2.2.3 Three-dimensional interferometry analyzer

The three-dimensional interferometry analyzer shall have an ability to measure the surface of the ferrule endface with an accuracy better than ±10 nm. The analyzer shall consist of a microscope unit, a surface data processing unit, and a monitor.

The microscope unit shall consist of an interference microscope, an actuator, and an image scanner. The interference microscope equipped with an objective is arranged so that its motion is parallel to the axis of the ferrule. The actuator transports the objective vertically. The image scanner converts interference image signals into position data.

The surface data processing unit shall be able to process the position data so as to measure the fibre undercut or protrusion: the unit calculates an ideal spherical surface fitted to the spherical ferrule endface from the measured surface data and calculates converted surface data from the measured surface data by extracting the ideal spherical surface data. The unit also has an ability to correct the surface data taking into account the difference in refractive indices and absorption coefficients of the fibre and the ferrule.

The monitor shall display the measured and calculated three-dimensional surface profiles.

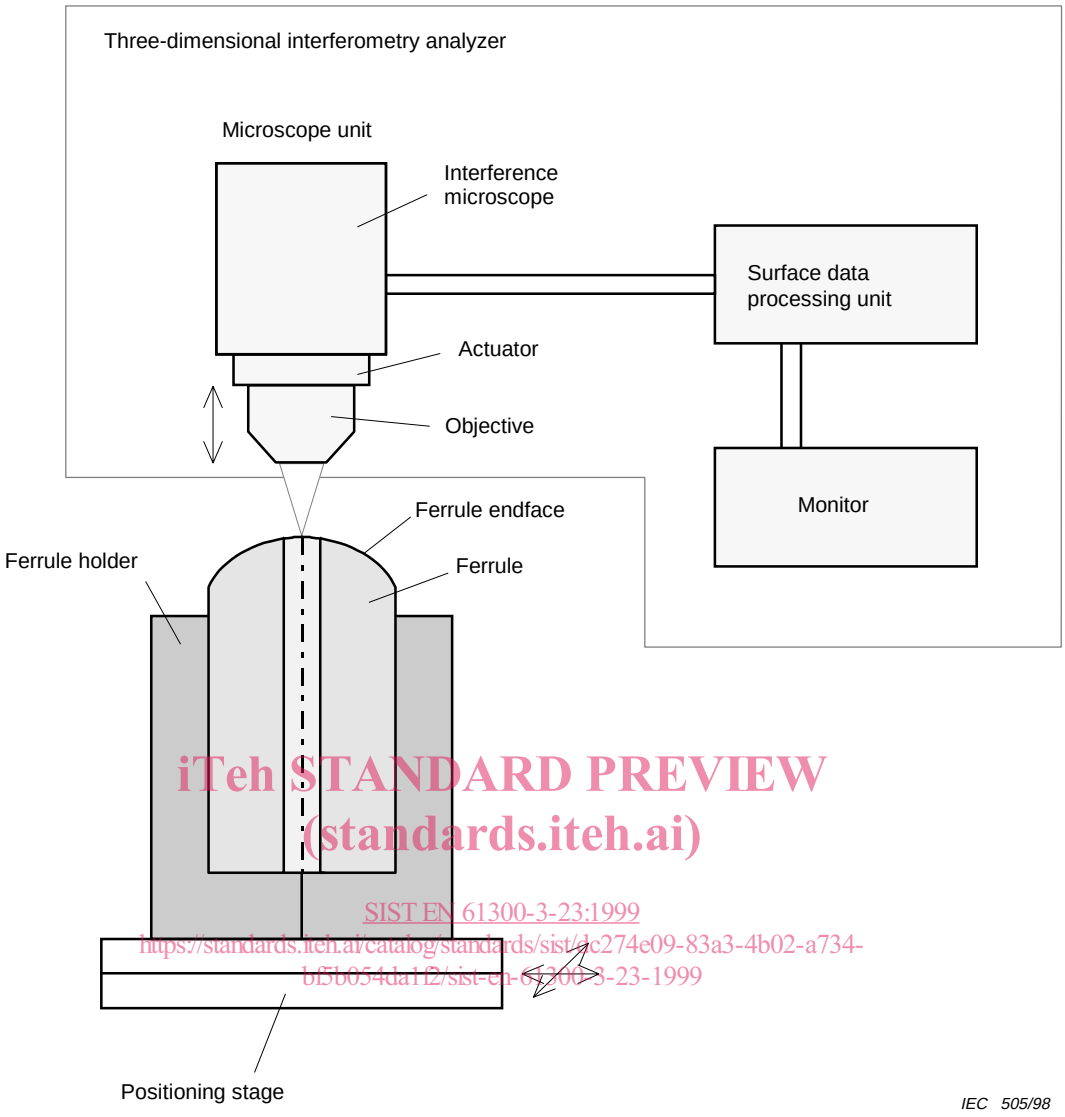


Figure 3 – Apparatus for three-dimensional surface analysis by interferometry system

2.3 Method 3 – Two-dimensional surface analysis by interferometry system

The apparatus shown in figure 4 consists of a suitable ferrule holder, a positioning stage, and a two-dimensional interferometry analyzer.

2.3.1 Ferrule holder

The ferrule holder is a suitable device to hold the ferrule in a fixed vertical position, or in a tilted position in the case of an angled ferrule type.

2.3.2 Positioning stage

The ferrule holder is fixed to the positioning stage, which shall enable the holder to be moved to the appropriate position. The stage shall have enough rigidity so as to measure the ferrule endface with a precision of some nanometres.