SLOVENSKI STANDARD
SIST EN IEC 61300-3-55:2020

01-september-2020

Optični spojni elementi in pasivne komponente - Postopki osnovnega preskušanja in meritev- 3-55. del: Preiskave in meritve - Stopnja slabljenja polarizacije in točnost ujemanja pasivnih optičnih komponent pri ohranjanju polarizacije (IEC 61300-3-55:2020)

Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 3-55: Examinations and measurements - Polarisation extinction ratio and keying accuracy of polarisation maintaining, passive, optical components (IEC 61300-3-55:2020)

Lichtwellenleiter-Verbindungselemente und passive Bauteile - Grundlegende Prüf- und Messverfahren - Teil 3-55: Untersuchungen und Messungen - Polarisationsauslöschungsverhältnis und Tastgenauigkeit von polarisationserhaltenden, passiven, optischen Komponenten (IEC 61300-3-55:2020)

Dispositifs d’interconnexion et composants passifs fibroniques – Procédures fondamentales d’essais et de mesures - Partie 3-55: Examens et mesures - Rapport d’extinction de polarisation et précision du détrompage des composants optiques passifs maintenant la polarisation (IEC 61300-3-55:2020)

Ta slovenski standard je istoveten z: **EN IEC 61300-3-55:2020**

ICS:

33.180.20	Povezovalne naprave za optična vlakna	Fibre optic interconnecting devices

SIST EN IEC 61300-3-55:2020 **en**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN IEC 61300-3-55

June 2020

ICS 33.180.20

English Version

Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 3-55:Examinations and measurements - Polarisation extinction ratio and keying accuracy of polarisation maintaining, passive, optical components (IEC 61300-3-55:2020)

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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Ref. No. EN IEC 61300-3-55:2020 E

European foreword

The text of document 86B/4276/FDIS, future edition 1 of IEC 61300-3-55, 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 61300-3-55:2020.

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)	2021-03-11
• latest date by which the national standards conflicting with the document have to be withdrawn	(dow)	2023-06-11

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The text of the International Standard IEC 61300-3-55:2020 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 60874-1	NOTE	Harmonized as EN 60874-1
IEC 61300-3-24	NOTE	Harmonized as EN 61300-3-24
IEC 61300-3-40	NOTE	Harmonized as EN 61300-3-40

IEC 61300-3-55

Edition 1.0 2020-05

INTERNATIONAL STANDARD

NORME INTERNATIONALE

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

COMMISSION ELECTROTECHNIQUE INTERNATIONALE

ICS 33.180.20

ISBN 978-2-8322-8255-7

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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FOREWORD

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International Standard IEC 61300-3-55 has been prepared by subcommittee 86B: Fibre optic interconnecting devices and passive components, of IEC technical committee 86: Fibre optics.

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

FDIS	Report on voting
86B/4276/FDIS	86B/4290/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.

INTRODUCTION

This document contains and expands the content of IEC 61300-3-24 and IEC 61300-3-40.

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

Part 3-55: Examinations and measurements – Polarisation extinction ratio and keying accuracy of polarisation maintaining, passive, optical components

1 Scope

This part of IEC 61300 provides methods for measuring the polarisation extinction ratio (PER) of single-mode, polarisation maintaining (PM) optical components based upon PM fibres. This document also provides methods for detecting the input and output orientation of the PM components' principal axes as well as methods for estimating the keying accuracy, i.e. the angular misalignment between the principal axes and the mechanical reference guide key of the connectors, if these are present.

2 Normative references

There are no normative references in this document.

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions

For the purpose of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in 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

3.1.1
principal state of polarisation
PSP
state of polarisation (SOP) that propagates unaltered through an optically anisotropic medium

Note 1 to entry: It is also known as "eigen polarisation".

Note 2 to entry: This note applies to the French language only.

3.1.2
polarisation extinction ratio
PER
fraction of the power of one PSP that leaks onto the orthogonal one as it propagates along the polarisation maintaining component

Note 1 to entry: This note applies to the French language only.

3.2 Abbreviated terms

Term	Description
DUT	device under test

HWP	half wave plate
PER	polarisation extinction ratio
PM	polarisation maintaining
PSP	principal state of solarisation
QWP	quarter wave plate
SLD	super luminescent diode
SMF	single-mode fibre
SOP	state of polarisation

4 General description

A PM component is a physical system that can retain specific input SOP unaltered as light propagates through it. In linearly birefringent systems, these SOPs correspond to two linear polarisations, also referred to as PSPs, whose polarisation direction is parallel to the two PM-element's principal axes.

While, in ideal PM components, the two principal states of polarisation (PSPs) propagate uncoupled and unaltered, in reality they may exchange energy, effectively deviating from the initial SOP. The origin of such deviations from the ideal behaviour may be:

- intrinsic and ascribable to imperfections in the optical guiding material structure, or
- extrinsic and related to external mechanical (stress), electrical, or thermal changes applied to the PM component or a portion thereof.

How accurately a PM component can hold its PSPs is quantified by the PER. This document defines measurement methods based upon the power coupling between the two nominal PSPs in a linearly birefringent system when incoherent, linearly polarised light is injected into the PM component under test (hereafter PM-DUT).

Where a PM component is a concatenation of several distinct PM sub-elements, the overall system performance will be strongly influenced by how precisely the optical axes of the individual sub-elements are aligned with each other at the interconnecting points. Since optical fibre connectors are most often found at such junctions, it is of primary importance to evaluate and assure that their reference keying mechanisms are properly aligned to the encapsulated fibre's principal axes so that the PSPs may keep propagating unaltered. Methods for determining such angular mismatch are also described. These rely upon the same set-ups used by the methods proposed for the characterisation of the PER performance.

This document describes two methods for the measurement of PER performance and the keying accuracy: a reference-less method (method A) and a comparative method (method B). Care shall be taken when comparing the results obtained by the two methods because the measured PER values refer to two distinct configurations. Additional information on keying accuracy for PM fiber is found in Annex B.

5 Measurement principles

Both methods A and B rely upon the cross-polariser test procedure, which evaluates the PM performance of a linearly birefringent PM-DUT by assessing the ratio between the power of the linearly polarised components oriented along the two principal axes exiting the optical component compared with the input power coupled into the PM-DUT.

A prerequisite to this measurement procedure is that the polarisation response of the component to be tested is stationary, i.e. the polarisation performance is not actively influenced or modified by external factors (electrical, mechanical, thermal, or other such as fibre and