SLOVENSKI STANDARD
SIST EN IEC 61280-4-3:2022

01-november-2022

Postopki preskušanja optičnega komunikacijskega podsistema - 4-3. del: Vgrajena pasivna optična omrežja - Meritve slabljenja in optičnih povratnih izgub (IEC 61280-4-3:2022)

Fibre-optic communication subsystem test procedures - Part 4-3: Installed passive optical networks - Attenuation and optical return loss measurements (IEC 61280-4-3:2022)

Prüfverfahren für Lichtwellenleiter-Kommunikationsuntersysteme - Teil 4-3: Installierte passive optische Netze - Messung von Dämpfung und optischer Rückflussdämpfung (IEC 61280-4-3:2022)

Procédures d’essai des sous-systèmes de télécommunications fibroniques - Partie 4-3: Installations de réseau optique passif - Mesures de l’affaiblissement et de l’affaiblissement de réflexion optique (IEC 61280-4-3:2022)

Ta slovenski standard je istoveten z: **EN IEC 61280-4-3:2022**

ICS:

33.180.01	Sistemi z optičnimi vlakni na splošno	Fibre optic systems in general

SIST EN IEC 61280-4-3:2022 **en**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN IEC 61280-4-3

September 2022

ICS 33.180.01

English Version

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European Committee for Electrotechnical Standardization
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Ref. No. EN IEC 61280-4-3:2022 E

European foreword

The text of document 86C/1749A/CDV, future edition 1 of IEC 61280-4-3, prepared by SC 86C "Fibre optic systems and active devices" of IEC/TC 86 "Fibre optics" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 61280-4-3:2022.

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)	2023-06-02
• latest date by which the national standards conflicting with the document have to be withdrawn	(dow)	2025-09-02

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC shall not be held responsible for identifying any or all such patent rights.

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Endorsement notice

The text of the International Standard IEC 61280-4-3:2022 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 60875-1:2015 NOTE Harmonized as EN 60875-1:2015 (not modified)

IEC 61280-1-1 NOTE Harmonized as EN 61280-1-1

IEC 61746-2 NOTE Harmonized as EN 61746-2

IEC 61755-3-1[1] NOTE Harmonized as EN 61755-3-1[2]

IEC 61755-3-2[3] NOTE Harmonized as EN 61755-3-2[4]

IEC 62074-1:2014 NOTE Harmonized as EN 62074-1:2014 (not modified)

[1] Under preparation. Stage at the time of publication: IEC 61755-3-1/CD:2022.

[2] Under preparation. Stage at the time of publication: prEN IEC 61755-3-1:2020.

[3] Under preparation. Stage at the time of publication: IEC 61755-3-2/CD:2022.

[4] Under preparation. Stage at the time of publication: prEN IEC 61755-3-2:2020.

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE 1 Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

Publication	Year	Title	EN/HD	Year
IEC 60793-2-50	-	Optical fibres - Part 2-50: Product specifications - Sectional specification for class B single-mode fibres	EN IEC 60793-2-50	-
IEC 61280-1-3	-	Fibre optic communication subsystem test procedures - Part 1-3: General communication subsystems - Measurement of central wavelength, spectral width and additional spectral characteristics	EN IEC 61280-1-3	-
IEC 61280-4-2	-	Fibre-optic communication subsystem test procedures - Part 4-2: Installed cable plant - Single-mode attenuation and optical return loss measurement	EN 61280-4-2	-
IEC/TR 61282-14	2019	Fibre optic communication system design guidelines - Part 14: Determination of the uncertainties of attenuation measurements in fibre plants	-	-
IEC 61300-3-35	-	Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 3-35: Examinations and measurements - Visual inspection of fibre optic connectors and fibre-stub transceivers	EN 61300-3-35	-
IEC 61315	-	Calibration of fibre-optic power meters	EN IEC 61315	-
IEC 61746-1	2009	Calibration of optical time-domain reflectometers (OTDR) - Part 1: OTDR for single mode fibres	EN 61746-1	2011
			+ AC	2014
IEC 61753-031-2	-	Fibre optic interconnecting devices and passive components - Performance standard - Part 031-2: Non-connectorized single-mode 1 × N and 2 × N non-wavelength-selective branching devices for Category C - Controlled environment	EN 61753-031-2	-

IEC 61753-031-3	-	Fibre optic interconnecting devices and passive components - Performance standard - Part 031-3: Non-connectorized single-mode 1×N and 2×N non-wavelength-selective branching devices for Category U - Uncontrolled environment	EN 61753-031-3	-
IEC 61753-031-6	-	Fibre optic interconnecting devices and passive components - Performance standard - Part 031-6: Non-connectorized single-mode 1×N and 2×N non-wavelength-selective branching devices for Category O - Uncontrolled environment	EN 61753-031-6	-
IEC 61753-1	-	Fibre optic interconnecting devices and passive components - Performance standard - Part 1: General and guidance	EN IEC 61753-1	-
IEC/TR 62627-01	-	Fibre optic interconnecting devices and passive components - Part 01: Fibre optic connector cleaning methods	-	-

IEC 61280-4-3

Edition 1.0 2022-07

INTERNATIONAL STANDARD

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INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

ICS 33.180.01

ISBN 978-2-8322-4801-0

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FIBRE OPTIC COMMUNICATION SUBSYSTEM TEST PROCEDURES –

Part 4-3: Installed passive optical networks – Attenuation and optical return loss measurements

FOREWORD

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IEC 61280-4-3 has been prepared by subcommittee 86C: Fibre optic systems and active devices, of IEC technical committee 86: Fibre optics. It is an International Standard.

This publication contains an attached file titled "Supplemental Data" in the form of an Excel spread sheet. This file is intended to be used as a complement and does not form an integral part of the standard.

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

Draft	Report on voting
86C/1749A/CDV	86C/1787/RVC

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

A list of all parts in the IEC 61280 series, published under the general title *Fibre optic communication subsystem test 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 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.

IMPORTANT – The "colour inside" logo on the cover page of this document indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INTRODUCTION

IEC has developed a large set of standards for measurement of fibre optic cable plants. These standards are applicable to passive optical networks (PONs) if specifics of these networks are known and understood. This document provides dedicated procedures for attenuation measurements in PONs as well as additional information.

For the purpose of this document, a PON is a point-to-multipoint network that includes optical line terminals (OLTs), optical network terminals (ONTs), and an optical fibre infrastructure that is entirely passive and is represented by a single-rooted point-to-multipoint tree of optical fibres with splitters, combiners, filters, and other passive components.

PONs are commonly used in fibre-to-the-home (FTTH) and fibre-to-the-building (FTTB) optical access networks (OAN). In addition, the measurement principles described in this document may also apply to PONs used in other applications, like passive optical local area networks (PO-LANs).

FIBRE OPTIC COMMUNICATION SUBSYSTEM TEST PROCEDURES –

Part 4-3: Installed passive optical networks – Attenuation and optical return loss measurements

1 Scope

This part of IEC 61280 describes the measurement of attenuation, optical return loss and optical power in installed passive optical networks (PONs) using single-mode fibre**.**

This document specifies two methods for measuring the attenuation before activation of the PON:

- method A: one-cord method using a light source and a power meter (LSPM);
- method B: optical time-domain reflectometer (OTDR) method in upstream direction only, with reduction of uncertainties due to the variation of backscatter coefficient.

In addition, method C, which is described in informative Annex C, provides an estimate of the attenuation after partial activation of the PON by using a U band filtered optical time-domain reflectometer (FOTDR) in an upstream direction.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60793-2-50, *Optical fibres – Part 2-50: Product specifications – Sectional specification for class B single-mode fibres*

IEC 61280-1-3, *Fibre-optic communication subsystem test procedures – Part 1-3: General communication subsystems – Measurement of central wavelength, spectral width and additional spectral characteristics*

IEC 61280-4-2, *Fibre-optic communication subsystem test procedures – Part 4-2: Installed cable plant – Single-mode attenuation and optical return loss measurement*

IEC TR 61282-14:2019, *Fibre optic communication system design guidelines – Part 14: Determination of the uncertainties of attenuation measurements in fibre plants*

IEC 61300-3-35, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 3-35: Examinations and measurements – Visual inspection of fibre optic connectors and fibre-stub transceivers*

IEC 61315, *Calibration of fibre-optic power meters*

IEC 61746-1:2009, *Calibration of optical time-domain reflectometers (OTDR) – Part 1: OTDR for single-mode fibres*

IEC 61753-031-2, *Fibre optic interconnecting devices and passive components – Performance standard – Part 031-2: Non-connectorized single-mode 1 × N and 2 × N non-wavelength-selective branching devices for Category C − Controlled environment*