

# SLOVENSKI STANDARD

## SIST EN 61280-4-2:2001

01-februar-2001

---

### Fibre optic communication subsystem basic test procedures - Part 4-2: Fibre optic cable plant - Single-mode fibre optic cable plant attenuation (IEC 61 280-4-2:1999)

Fibre optic communication subsystem basic test procedures -- Part 4-2: Fibre optic cable plant - Single-mode fibre optic cable plant attenuation

Lichtwellenleiter-Kommunikationsuntersysteme - Grundlegende Prüfverfahren -- Teil 4-2: Lichtwellenleiter-Kabelanlagen - Dämpfungsmessung in Einmoden-LWL-Kabelanlagen

Procédures d'essai de base des sous-systèmes de télécommunication à fibres optiques - - Partie 4-2: Installation de câbles à fibres optiques - Affaiblissement des installations de câbles à fibres unimodales

Ta slovenski standard je istoveten z: **EN 61280-4-2:1999**

---

#### **ICS:**

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

**SIST EN 61280-4-2:2001**

**en**

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

SIST EN 61280-4-2:2001

<https://standards.iteh.ai/catalog/standards/sist/b65ca90e-82af-4b8a-8b3e-210e7f9a5c6f/sist-en-61280-4-2-2001>

English version

**Fibre optic communication subsystem basic test procedures**  
**Part 4-2: Fibre optic cable plant**  
**Single-mode fibre optic cable plant attenuation**  
(IEC 61280-4-2:1999)

Procédures d'essai de base des  
sous-systèmes de télécommunication  
à fibres optiques  
Partie 4-2: Installation de câbles à  
fibres optiques  
Affaiblissement des installations de  
câbles à fibres unimodales  
(CEI 61280-4-2:1999)

Lichtwellenleiter-Kommunikations-  
untersysteme  
Grundlegende Prüfverfahren  
Teil 4-2: Lichtwellenleiter-Kabelanlagen  
Dämpfungsmessung in  
Einmoden-LWL-Kabelanlagen  
(IEC 61280-4-2:1999)

This European Standard was approved by CENELEC on 1999-10-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

## 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**

### Foreword

The text of document 86C/246/FDIS, future edition 1 of IEC 61280-4-2, 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 was approved by CENELEC as EN 61280-4-2 on 1999-10-01.

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) 2000-07-01
- latest date by which the national standards conflicting  
with the EN have to be withdrawn (dow) 2002-10-01

Annexes designated "normative" are part of the body of the standard.

Annexes designated "informative" are given for information only.

In this standard, annex ZA is normative and annex A is informative.

Annex ZA has been added by CENELEC.

---

### Endorsement notice

The text of the International Standard IEC 61280-4-2:1999 was approved by CENELEC as a European Standard without any modification.

In the official version, for annex A, Bibliography, the following note has to be added for the standard indicated:

IEC 60825-1 NOTE: Harmonized as EN 60825-1:1994 (not modified).

---

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

[SIST EN 61280-4-2:2001](https://standards.iteh.ai/catalog/standards/sist/b65ca90e-82af-4b8a-8b3e-210e7f9a5c6f/sist-en-61280-4-2-2001)

[https://standards.iteh.ai/catalog/standards/sist/b65ca90e-82af-4b8a-8b3e-](https://standards.iteh.ai/catalog/standards/sist/b65ca90e-82af-4b8a-8b3e-210e7f9a5c6f/sist-en-61280-4-2-2001)

[210e7f9a5c6f/sist-en-61280-4-2-2001](https://standards.iteh.ai/catalog/standards/sist/b65ca90e-82af-4b8a-8b3e-210e7f9a5c6f/sist-en-61280-4-2-2001)

**Annex ZA** (normative)

**Normative references to international publications  
with their corresponding European publications**

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

NOTE: When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60793-1-4	1995	Optical fibres Part 1: Generic specification Section 4: Measuring methods for transmission and optical characteristics	-	-
IEC 61281-1	1999	Fibre optic communication subsystems Part 1: Generic specification	EN 61281-1	1999
IEC 61300-3-4	1998	Fibre optic interconnecting devices and passive components - Basic test and measurement procedures Part 3-4: Examination and measurements Attenuation	EN 61300-3-4	1998
IEC 61300-3-6	1997	Part 3-6: Examinations and measurements Return loss	EN 61300-3-6	1997
IEC 61315	1995	Calibration of fibre optic power meters	EN 61315	1997

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

SIST EN 61280-4-2:2001

<https://standards.iteh.ai/catalog/standards/sist/b65ca90e-82af-4b8a-8b3e-210e7f9a5c6f/sist-en-61280-4-2-2001>

NORME  
INTERNATIONALE  
INTERNATIONAL  
STANDARD

CEI  
IEC

61280-4-2

Première édition  
First edition  
1999-08

---

---

**Procédures d'essai de base des sous-systèmes  
de télécommunication à fibres optiques –**

**Partie 4-2:  
Installation de câbles à fibres optiques –  
Affaiblissement des installations de câbles  
à fibres unimodales**

**Fibre optic communication subsystem  
basic test procedures –**

**Part 4-2:  
Fibre optic cable plant –  
Single-mode fibre optic cable plant attenuation**

© IEC 1999 Droits de reproduction réservés — Copyright - all rights reserved

Aucune partie de cette publication ne peut être reproduite ni utilisée sous quelque forme que ce soit et par aucun procédé, électronique ou mécanique, y compris la photocopie et les microfilms, sans l'accord écrit de l'éditeur.

No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from the publisher.

International Electrotechnical Commission  
Telefax: +41 22 919 0300

3, rue de Varembe Geneva, Switzerland  
e-mail: inmail@iec.ch IEC web site <http://www.iec.ch>



Commission Electrotechnique Internationale  
International Electrotechnical Commission  
Международная Электротехническая Комиссия

CODE PRIX  
PRICE CODE

N

*Pour prix, voir catalogue en vigueur  
For price, see current catalogue*

## CONTENTS

	Page
FOREWORD .....	5
Clause	
1 Scope and object .....	9
2 Normative references .....	9
3 Apparatus .....	11
3.1 Method 1 – Optical power meter .....	11
3.1.1 Light source .....	11
3.1.2 Optical power measurement equipment .....	11
3.1.3 Test jumpers .....	11
3.2 Method 2 – Optical time domain reflectometer (OTDR) .....	11
4 Test sample .....	13
5 Procedure .....	13
5.1 Method 1 – Insertion loss using an optical power meter .....	13
5.1.1 Method 1a – One jumper-cable measurement .....	15
5.1.2 Method 1b – Two jumper-cable measurement .....	15
5.1.3 Method 1c – Three jumper-cable measurement .....	17
5.2 Method 2 – Insertion loss using an OTDR .....	19
5.2.1 Calibration verification .....	19
5.2.2 Cable plant attachment .....	21
5.2.3 OTDR set-up .....	21
5.2.4 Initial adjustment .....	21
5.2.5 First cursor placement .....	23
5.2.6 Second cursor placement .....	23
5.2.7 Bi-directional measurement .....	23
6 Calculations .....	23
6.1 Method 1 .....	23
6.2 Method 2 .....	23
6.3 Judgments .....	23
7 Test results .....	25
7.1 Required information .....	25
7.2 Available information .....	25
8 Specification information .....	25
Annex A (informative) Bibliography .....	27



## INTERNATIONAL ELECTROTECHNICAL COMMISSION

---

**FIBRE OPTIC COMMUNICATION SUBSYSTEM  
BASIC TEST PROCEDURES –**
**Part 4-2: Fibre optic cable plant –  
Single-mode fibre optic cable plant attenuation**

## 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.
- 2) The formal decisions or agreements of the IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested National Committees.
- 3) The documents produced have the form of recommendations for international use and are published in the form of standards, technical specifications, technical reports or guides and they are accepted by the National Committees in that sense.
- 4) In order to promote international unification, IEC National Committees undertake to apply IEC International Standards transparently to the maximum extent possible in their national and regional standards. Any divergence between the IEC Standard and the corresponding national or regional standard shall be clearly indicated in the latter.
- 5) The IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with one of its standards.
- 6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. The IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 61280-4-2 has been prepared by subcommittee 86C: Fibre optic systems and active devices, of IEC technical committee 86: Fibre optics.

The text of this standard is based on the following documents:

FDIS	Report on voting
86C/246/FDIS	86C/253/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.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 3.

Annex A is for information only.

The committee has decided that the contents of this publication will remain unchanged until 2005. At this date, the publication will be

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

Future standards in this series will carry the new general title as cited above. Titles of existing standards in this series will be updated at the time of the next edition.

## **iTeh STANDARD PREVIEW (standards.iteh.ai)**

SIST EN 61280-4-2:2001

<https://standards.iteh.ai/catalog/standards/sist/b65ca90e-82af-4b8a-8b3e-210e7f9a5c6f/sist-en-61280-4-2-2001>

## FIBRE OPTIC COMMUNICATION SUBSYSTEM BASIC TEST PROCEDURES –

### Part 4-2: Fibre optic cable plant – Single-mode fibre optic cable plant attenuation

#### 1 Scope and object

The purpose of this part of IEC 61280 is to describe procedures to measure the optical attenuation (loss) performance of installed single-mode fibre optic cable plants. It is neither intended for component testing, nor does it define those elements of an installation which are to be measured. The document that invokes the procedure of this part of IEC 61280 is to establish the requirements for installation, maintenance, repair and conformance testing.

The optical attenuation (loss) performance is a specific test associated with IEC 61281-1.

The test procedure of this part of IEC 61280 may be used to measure the optical loss between any two passively connected points, including end terminations, of a single-mode fibre optic cable plant. The fibre optic cable plant may consist of fibre optic cables, connectors, mounting panels, jumper cables, and other passive components, but may not include active components.

iTeh STANDARD PREVIEW

#### 2 Normative references (standards.iteh.ai)

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of IEC 61280. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of IEC 61280 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of IEC and ISO maintain registers of currently valid International Standards.

IEC 60793-1-4:1995, *Optical fibres – Part 1: Generic specification – Section 4: Measuring methods for transmission and optical characteristics*

IEC 61281-1:1999, *Fibre optic communication subsystems – Part 1: Generic specification*

IEC 61300-3-4:1998, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 3-4: Examination and measurements – Attenuation*

IEC 61300-3-6:1997, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 3-6: Examinations and measurements – Return loss*

IEC 61315:1995, *Calibration of fibre optic power meters*