



**NSAI**  
Standards

Irish Standard  
I.S. EN 61280-4-1:2009

Fibre optic communication subsystem  
test procedures -- Part 4-1: Installed  
cable plant - Multimode attenuation  
measurement (IEC 61280-4-1:2009  
(EQV))

## I.S. EN 61280-4-1:2009

*Incorporating amendments/corrigenda issued since publication:*

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English version

**Fibre optic communication subsystem test procedures -  
Part 4-1: Installed cable plant -  
Multimode attenuation measurement  
(IEC 61280-4-1:2009)**

Procédures d'essai des sous-systèmes  
de télécommunication à fibres optiques -  
Partie 4-1: Installation câblée -  
Mesure de l'affaiblissement en multimodal  
(CEI 61280-4-1:2009)

Prüfverfahren für Lichtwellenleiter-  
Kommunikationsunterssysteme -  
Teil 4-1: Lichtwellenleiter-Kabelanlagen -  
Mehrmoden-Dämpfungsmessungen  
(IEC 61280-4-1:2009)

This European Standard was approved by CENELEC on 2009-10-01. 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.

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**CENELEC**

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

**Central Secretariat: Avenue Marnix 17, B - 1000 Brussels**

**I.S. EN 61280-4-1:2009**

EN 61280-4-1:2009

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**Foreword**

The text of document 86C/879/FDIS, future edition 2 of IEC 61280-4-1, 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 61280-4-1 on 2009-10-01.

This European Standard supersedes EN 61280-4-1:2004.

The main changes with respect to EN 61280-4-1:2004 are listed below:

- an additional measurement method based on optical time domain reflectometry (OTDR) is documented, with guidance on best practice in using the OTDR and interpreting OTDR traces;
- the requirement for the sources used to measure multimode fibres is changed from one based on coupled power ratio (CPR) and mandrel requirement to one based on measurements of the near field at the output of the launching test cord;
- highlighting the importance of, and giving guidance on, good measurement practices including cleaning and inspection of connector end faces.

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) 2010-07-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2012-10-01

Annex ZA has been added by CENELEC.

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**Endorsement notice**

The text of the International Standard IEC 61280-4-1:2009 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 60793-1-40	NOTE	Harmonized as EN 60793-1-40:2003 (modified).
IEC 60793-2	NOTE	Harmonized as EN 60793-2:2008 (not modified).
IEC 60793-2-10	NOTE	Harmonized as EN 60793-2-10:2007 (not modified).
IEC 60793-2-50	NOTE	Harmonized as EN 60793-2-50:2008 (not modified).
IEC 61300-3-6	NOTE	Harmonized as EN 61300-3-6:2009 (not modified).

## Annex ZA (normative)

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

The following referenced documents are indispensable for the application 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 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 60825-2	- <sup>1)</sup>	Safety of laser products - Part 2: Safety of optical fibre communication systems (OFCS)	EN 60825-2	2004 <sup>2)</sup>
IEC 61280-1-3	- <sup>3)</sup>	Fibre optic communication subsystem test procedures - Part 1-3: General communication subsystems - Central wavelength and spectral width measurement	EN 61280-1-3	- <sup>3)</sup>
IEC 61280-1-4	- <sup>1)</sup>	Fibre optic communication subsystem test procedures - Part 1-4: General communication subsystems - Light source encircled flux measurement method	EN 61280-1-4	200X <sup>4)</sup>
IEC/PAS 61300-3-35	- <sup>1)</sup>	Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 3-35: Examinations and measurements - Fibre optic cylindrical connector endface visual inspection	-	-
IEC 61315	- <sup>1)</sup>	Calibration of fibre-optic power meters	EN 61315	2006 <sup>2)</sup>
IEC 61745	- <sup>1)</sup>	End-face image analysis procedure for the calibration of optical fibre geometry test sets	-	-
IEC 61746	- <sup>1)</sup>	Calibration of optical time-domain reflectometers (OTDR)	EN 61746	2005 <sup>2)</sup>

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<sup>1)</sup> Undated reference.

<sup>2)</sup> Valid edition at date of issue.

<sup>3)</sup> At draft stage.

<sup>4)</sup> To be ratified.

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

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### FIBRE-OPTIC COMMUNICATION SUBSYSTEM TEST PROCEDURES –

#### Part 4-1: Installed cable plant – Multimode attenuation measurement

#### FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of 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, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as “IEC Publication(s)”). 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. 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 61280-4-1 has been prepared by subcommittee 86C: Fibre optic systems and active devices, of IEC technical committee 86: Fibre optics.

This second edition cancels and replaces the first edition, published in 2003, and constitutes a technical revision.

The main changes with respect to the previous edition are listed below:

- An additional measurement method based on optical time domain reflectometry (OTDR) is documented, with guidance on best practice in using the OTDR and interpreting OTDR traces.
- The requirement for the sources used to measure multimode fibres is changed from one based on coupled power ratio (CPR) and mandrel requirement to one based on measurements of the near field at the output of the launching test cord.

- Highlighting the importance of, and giving guidance on, good measurement practices including cleaning and inspection of connector end faces.

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

FDIS	Report on voting
86C/879/FDIS	86C/892/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 2.

A list of all the parts in the IEC 61280 series, under the general title *Fibre-optic communication subsystem test procedure*, can be found on the IEC website.

For the Part 4, the new subtitle will be *Installed cable plant*. Subtitles of existing standards in this series will be updated at the time of the next edition.

The committee has decided that the contents of this publication will remain unchanged until the maintenance result date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

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

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

## FIBRE-OPTIC COMMUNICATION SUBSYSTEM TEST PROCEDURES –

### Part 4-1: Installed cable plant – Multimode attenuation measurement

#### 1 Scope

This part of IEC 61280-4 is applicable to the measurement of attenuation of installed fibre-optic cabling using multimode fibre, typically in lengths of up to 2 000 m. This cabling can include multimode fibres, connectors, adapters and splices.

Cabling design standards such as ISO/IEC 11801, ISO/IEC 24702 and ISO/IEC 24764 contain specifications for this type of cabling. ISO/IEC 14763-3, which supports these design standards, makes reference to the test methods of this standard.

In this standard, the fibre types that are addressed include category A1a (50/125  $\mu\text{m}$ ) and A1b (62,5/125  $\mu\text{m}$ ) multimode fibres, as specified in IEC 60793-2-10. The attenuation measurements of the other multimode categories can be made, using the approaches of this standard, but the source conditions for the other categories have not been defined.

#### 2 Normative references

The following referenced documents are indispensable for the application 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 60825-2, *Safety of laser products – Part 2: Safety of optical fibre communication systems (OFCS)*

IEC 61280-1-3, *Fibre optic communication subsystem basic test procedures – Part 1-3: Test procedures for general communication subsystems – Central wavelength and spectral width measurement*

IEC 61280-1-4, *Fibre optic communication subsystem test procedures – Part 1-4: General communication subsystems – Light source encircled flux measurement method<sup>1</sup>*

IEC 61300-3-35, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 3-35: Examinations and measurements – Fibre optic cylindrical connector endface visual inspection*

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

IEC 61745, *End-face image analysis procedure for the calibration of optical fibre geometry test sets*

IEC 61746, *Calibration of optical time-domain reflectometers (OTDRs)*

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<sup>1</sup> A new edition is in preparation.

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