

INTERNATIONAL STANDARD



**Fibre-optic communication subsystem test procedures –
Part 4-5: Installed cabling plant – Attenuation measurement of MPO terminated
fibre optic cabling plant using test equipment with MPO interfaces**



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INTERNATIONAL ELECTROTECHNICAL COMMISSION

FIBRE-OPTIC COMMUNICATION SUBSYSTEM TEST PROCEDURES –**Part 4-5: Installed cabling plant –
Attenuation measurement of MPO terminated fibre
optic cabling plant using test equipment with MPO interfaces**

FOREWORD

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International Standard IEC 61280-4-5 has been prepared by subcommittee 86C: Fibre optic systems and active devices, of IEC technical committee 86: Fibre optics.

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

FDIS	Report on voting
86C/1669/FDIS	86C/1679/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.

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

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

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- withdrawn,
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FIBRE-OPTIC COMMUNICATION SUBSYSTEM TEST PROCEDURES –

Part 4-5: Installed cabling plant – Attenuation measurement of MPO terminated fibre optic cabling plant using test equipment with MPO interfaces

1 Scope

This part of IEC 61280 is applicable to the measurement of attenuation and determination of polarity and length of installed multimode and single-mode optical fibre cabling plant, terminated with MPO connectors, using test equipment having an MPO interface. This cabling plant can include multimode or single-mode optical fibres, connectors, adapters, splices, and other passive devices. The cabling can be installed in a variety of environments including residential, commercial, industrial, and data centre premises, as well as outside plant environments.

In this document, the optical fibres that are addressed include sub-categories A1-OM_x, where $x = 2, 3, 4$ and 5 (50/125 μm) multimode optical fibres, as specified in IEC 60793-2-10, and category B-652 and B-657 (9/125 μm) single-mode optical fibres, as specified in IEC 60793-2-50. The attenuation measurements of the other multimode and single-mode categories can also be made using a light source and power meter (LSPM) or optical time domain reflectometer (OTDR) utilising an internal or external optical switch having one MPO interface. Multimode measurements are made with an 850 nm source because transceivers used for parallel optics applications having an MPO interface only operate at 850 nm; 1 300 nm measurements are optional. Single-mode measurements are made with a 1 310 nm and/or 1 550 nm source because transceivers used for parallel optics applications having an MPO interface operate at these wavelengths. This document does not include descriptions of cabling that is not exclusively MPO to MPO.

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 60825 (all parts), *Safety of laser products*

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

IEC 61280-4-1:2019, *Fibre-optic communication subsystem test procedures – Part 4-1: Installed cabling plant – Multimode attenuation measurement*

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

IEC 61746-2, *Calibration of optical time-domain reflectometers (OTDR) – Part 2: OTDR for multimode fibres*

3 Terms, definitions, graphical symbols and abbreviated terms

For the purposes of this document, the following terms, definitions, graphical symbols and abbreviated terms apply.

ISO and IEC maintain terminological databases for use 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 Terms and definitions

3.1.1

adapter

female-part of a connector in which one or two plugs are inserted and aligned

[SOURCE: IEC TR 61931:1998, 2.6.4]

3.1.2

alternative test method

ATM

test method for measuring a given characteristic in a manner consistent with the definition of this characteristic, and giving results which are reproducible and relatable to the reference test method and to practical use

[SOURCE: IEC TR 61931:1998, 2.8.2, modified – The alternative term "practical test method (for optical fibres)" has been removed.]

3.1.3

attenuation

A

reduction of optical power induced by transmission through a medium such as cabling, given as A :

$$A = 10 \log_{10}(P_{\text{in}}/P_{\text{out}})$$

where

P_{in} and P_{out} are the power, typically measured in mW, into and out of the cabling

Note 1 to entry: Attenuation is expressed in dB.

3.1.4

bi-directional measurement

two measurements of the same optical fibre made by launching light into opposite ends of that fibre

3.1.5

channel

end-to-end transmission path connecting any two pieces of application-specific equipment

[SOURCE: ISO/IEC 11801-1:2017, 3.1.26]