

# INTERNATIONAL STANDARD

# NORME INTERNATIONALE



**Fibre- optic communication subsystem test procedures –  
Part 4-2: Installed cabling plant – Single-mode attenuation and optical return  
loss measurements**

**Procédures d'essai des sous-systèmes de télécommunication fibroniques –  
Partie 4-2: Installations câblées – Mesures de l'affaiblissement de réflexion  
optique et de l'affaiblissement des fibres unimodales**



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## CONTENTS

|  |    |
|--|----|
| FOREWORD.....  | 8  |
| INTRODUCTION.....  | 10 |
| 1 Scope.....   | 11 |
| 2 Normative references .....   | 11 |
| 3 Terms, definitions, graphical symbols and abbreviated terms.....                                 | 12 |
| 3.1 Terms and definitions.....   | 12 |
| 3.2 Graphical symbols .....  | 14 |
| 3.3 Abbreviated terms.....   | 16 |
| 4 Measurement methods .....  | 16 |
| 4.1 General.....   | 16 |
| 4.1.1 Document structure .....   | 16 |
| 4.1.2 Attenuation .....  | 17 |
| 4.1.3 Optical return loss .....  | 17 |
| 4.2 Cabling configurations and applicable test methods .....                                       | 18 |
| 4.2.1 Cabling configurations and applicable test methods for attenuation measurements.....         | 18 |
| 4.2.2 Cabling configurations and applicable test methods for optical return loss measurements..... | 22 |
| 5 Overview of uncertainties for attenuation measurements .....                                     | 22 |
| 5.1 General.....   | 22 |
| 5.2 Sources of significant uncertainties.....  | 22 |
| 5.3 Consideration of the power meter .....   | 22 |
| 5.4 Consideration of test cord and connector grade .....   | 23 |
| 5.4.1 General .....  | 23 |
| 5.4.2 Mode field diameter variation.....   | 23 |
| 5.5 Reflections from other interfaces.....   | 23 |
| 5.6 Optical source.....  | 24 |
| 5.7 Output power reference .....   | 24 |
| 5.8 Bi-directional measurements.....   | 24 |
| 5.9 Typical uncertainties for attenuation methods A, B, C, and D.....                              | 24 |
| 5.10 Typical uncertainty values for single-mode attenuation testing for method E .....             | 26 |
| 6 Apparatus.....   | 26 |
| 6.1 General.....   | 26 |
| 6.2 Light source .....   | 26 |
| 6.2.1 Stability .....  | 26 |
| 6.2.2 Spectral characteristics .....   | 27 |
| 6.3 Launch cord.....   | 28 |
| 6.4 Receive or tail cords .....  | 28 |
| 6.5 Substitution cord.....   | 28 |
| 6.6 Power meter – LSPM methods only.....   | 28 |
| 6.7 OTDR apparatus.....  | 29 |
| 6.8 Return loss test set.....  | 29 |
| 6.9 Connector end-face cleaning and inspection equipment.....                                      | 30 |
| 6.10 Adapters .....  | 30 |
| 7 Procedures.....  | 31 |
| 7.1 General.....   | 31 |
| 7.2 Common procedures.....   | 31 |

|         |  |    |
|---------|--|----|
| 7.2.1   | Care of the test cords .....                                   | 31 |
| 7.2.2   | Make reference measurements (LSPM and OCWR methods only) ..... | 31 |
| 7.2.3   | Inspect and clean the ends of the fibres in the cabling .....  | 31 |
| 7.2.4   | Make the measurements .....                                    | 32 |
| 7.2.5   | Make the calculations .....                                    | 32 |
| 7.3     | Calibration .....  | 32 |
| 7.4     | Safety .....   | 32 |
| 8       | Calculations .....   | 32 |
| 9       | Documentation .....  | 32 |
| 9.1     | Information for each test .....                                | 32 |
| 9.2     | Information to be made available .....                         | 33 |
| Annex A | (normative) One-cord reference method .....                    | 34 |
| A.1     | Applicability of test method .....                             | 34 |
| A.2     | Apparatus .....  | 34 |
| A.3     | Procedure .....  | 34 |
| A.4     | Calculation .....  | 35 |
| A.5     | Components of reported attenuation .....                       | 36 |
| Annex B | (normative) Three-cord reference method .....                  | 37 |
| B.1     | Applicability of test method .....                             | 37 |
| B.2     | Apparatus .....  | 37 |
| B.3     | Procedure .....  | 37 |
| B.4     | Calculations .....   | 38 |
| B.5     | Components of reported attenuation .....                       | 38 |
| Annex C | (normative) Two-cord reference method .....                    | 39 |
| C.1     | Applicability of test method .....                             | 39 |
| C.2     | Apparatus .....  | 39 |
| C.3     | Procedure .....  | 39 |
| C.4     | Calculations .....   | 41 |
| C.5     | Components of reported attenuation .....                       | 41 |
| Annex D | (normative) Equipment cord method .....                        | 42 |
| D.1     | Applicability of the test method .....                         | 42 |
| D.2     | Apparatus .....  | 42 |
| D.3     | Procedure .....  | 42 |
| D.4     | Calculation .....  | 43 |
| D.5     | Components of reported attenuation .....                       | 44 |
| Annex E | (normative) Optical time domain reflectometer .....            | 45 |
| E.1     | Applicability of test method .....                             | 45 |
| E.2     | Apparatus .....  | 45 |
| E.2.1   | General .....  | 45 |
| E.2.2   | OTDR .....   | 45 |
| E.2.3   | Test cords .....   | 45 |
| E.3     | Procedure (test method) .....                                  | 46 |
| E.4     | Calculation of attenuation .....                               | 47 |
| E.4.1   | General .....  | 47 |
| E.4.2   | Connection location .....                                      | 47 |
| E.4.3   | Definition of the power levels $F_1$ and $F_2$ .....           | 48 |
| E.4.4   | Alternative calculation .....                                  | 49 |
| E.5     | Calculation of optical return loss .....                       | 51 |

|         |   |    |
|---------|---|----|
| E.6     | Calculation of reflectance for discrete components .....  | 53 |
| E.7     | OTDR uncertainties .....  | 55 |
| Annex F | (normative) Continuous wave optical return loss measurement – Method A.....                                 | 56 |
| F.1     | Applicability of test method .....  | 56 |
| F.2     | Apparatus .....   | 56 |
| F.2.1   | General .....   | 56 |
| F.2.2   | Light source.....   | 56 |
| F.2.3   | Branching device or coupler .....   | 56 |
| F.2.4   | Power meters .....  | 57 |
| F.2.5   | Connector interface .....   | 57 |
| F.2.6   | Low reflection termination.....   | 57 |
| F.3     | Procedure .....   | 57 |
| F.3.1   | Test set characterization.....  | 57 |
| F.3.2   | Measurement procedure .....   | 59 |
| F.3.3   | Calculations.....   | 59 |
| Annex G | (normative) Continuous wave optical return loss measurement – Method B.....                                 | 61 |
| G.1     | Applicability of test method .....  | 61 |
| G.2     | Apparatus .....   | 61 |
| G.2.1   | General requirements .....  | 61 |
| G.2.2   | Known reflectance termination.....  | 61 |
| G.3     | Procedure .....   | 62 |
| G.3.1   | Set-up characterization.....  | 62 |
| G.3.2   | Measurement procedure .....   | 62 |
| G.3.3   | Calculation .....   | 63 |
| Annex H | (normative) On the use of reference-grade test cords .....  | 64 |
| H.1     | General.....  | 64 |
| H.2     | Practical configurations and assumptions.....   | 64 |
| H.2.1   | Component specifications .....  | 64 |
| H.2.2   | Conventions .....   | 65 |
| H.2.3   | Reference planes .....  | 65 |
| H.3     | Impact of using reference-grade test cords for recommended LSPM methods.....                                | 66 |
| H.4     | Examples for LSPM measurements.....   | 66 |
| H.4.1   | Example 1 (configuration A, one-cord method, Annex A) .....   | 66 |
| H.4.2   | Example 2 (configuration B, three-cord method, Annex B) .....   | 67 |
| H.4.3   | Example 3 (configuration C, two-cord method, Annex C) .....   | 67 |
| H.4.4   | Example 4 – Long haul system (one-cord reference method).....   | 68 |
| H.5     | Impact of using reference-grade test cords for different configurations using<br>the OTDR test method ..... | 68 |
| H.5.1   | Cabling configurations A, B and C .....   | 68 |
| H.5.2   | Cabling configuration D .....   | 69 |
| Annex I | (informative) OTDR configuration information.....   | 71 |
| I.1     | Introductory remarks .....  | 71 |
| I.2     | Fundamental parameters that define the operational capability of an OTDR.....                               | 72 |
| I.2.1   | Dynamic range .....   | 72 |
| I.2.2   | Dynamic margin.....   | 72 |
| I.2.3   | Pulse width.....  | 72 |
| I.2.4   | Averaging time .....  | 72 |
| I.2.5   | Dead zone .....   | 72 |
| I.3     | Other parameters.....   | 73 |

|   |  |    |
|---|--|----|
| 1.3.1   | Index of refraction.....   | 73 |
| 1.3.2   | Measurement range.....   | 73 |
| 1.3.3   | Distance sampling.....   | 73 |
| 1.4   | Other measurement configurations.....  | 73 |
| 1.4.1   | General.....   | 73 |
| 1.4.2   | Macrobend attenuation measurement.....   | 73 |
| 1.4.3   | Splice attenuation measurement.....  | 74 |
| 1.4.4   | Measurement with high reflection connectors or short length cabling.....   | 74 |
| 1.4.5   | Ghost.....   | 76 |
| 1.5   | More on the measurement method.....  | 77 |
| 1.6   | Bi-directional measurement.....  | 78 |
| 1.7   | OTDR bi-directional trace analysis.....  | 79 |
| 1.8   | Non-recommended practices.....   | 80 |
| 1.8.1   | Measurement without tail cord.....   | 80 |
| 1.8.2   | Two cursors measurement.....   | 80 |
| Annex J (informative)   | Test cord attenuation verification.....  | 81 |
| J.1   | Introductory remarks.....  | 81 |
| J.2   | Apparatus.....   | 81 |
| J.3   | Procedure.....   | 81 |
| J.3.1   | General.....   | 81 |
| J.3.2   | Test cord verification for the one-cord and two-cord reference test methods when using non-pinned or unpinned and non-plug or socket style connectors..... | 82 |
| J.3.3   | Test cord verification for the one-cord and two-cord reference test methods using pinned-to-unpinned or plug-to-socket style connectors.....               | 83 |
| J.3.4   | Test cord verification for the three-cord reference test method using non-pinned or unpinned and non-plug or socket style connectors.....                  | 85 |
| J.3.5   | Test cord verification for the three-cord reference test method using pinned-to-unpinned or plug-to-socket style connectors.....                           | 87 |
| Annex K (informative)   | Spectral attenuation measurement.....  | 89 |
| K.1   | Applicability of test method.....  | 89 |
| K.2   | Apparatus.....   | 89 |
| K.2.1   | Broadband light source.....  | 89 |
| K.2.2   | Optical spectrum analyser.....   | 89 |
| K.3   | Procedure.....   | 90 |
| K.3.1   | Reference scan.....  | 90 |
| K.3.2   | Measurement scan.....  | 90 |
| K.4   | Calculations.....  | 90 |
| Bibliography.....   |  | 91 |
| Figure 1 – Connector symbols.....   |  | 15 |
| Figure 2 – Symbol for cabling under test.....                                   |  | 16 |
| Figure 3 – Configuration A – Start and end of measured attenuations in RTM..... |  | 19 |
| Figure 4 – Configuration B – Start and end of measured attenuations in RTM..... |  | 20 |
| Figure 5 – Configuration C – Start and end of measured attenuations in RTM..... |  | 20 |
| Figure 6 – Configuration D – Start and end of measured attenuations in RTM..... |  | 21 |
| Figure 7 – Typical OTDR schematic diagram.....                                  |  | 29 |
| Figure 8 – Illustration of return loss test set.....                            |  | 30 |

|  |    |
|--|----|
| Figure A.1 – One-cord reference measurement.....                                 | 35 |
| Figure A.2 – One-cord test measurement.....                                      | 35 |
| Figure B.1 – Three-cord reference measurement .....                              | 37 |
| Figure B.2 – Three-cord test measurement .....                                   | 38 |
| Figure C.1 – Two-cord reference measurement.....                                 | 40 |
| Figure C.2 – Two-cord test measurement.....                                      | 40 |
| Figure C.3 – Two-cord test measurement for plug-to-socket style connectors ..... | 40 |
| Figure D.1 – Reference measurement.....  | 43 |
| Figure D.2 – Test measurement.....   | 43 |
| Figure E.1 – Test measurement for OTDR method .....                              | 47 |
| Figure E.2 – Location of the cabling under test ports .....                      | 48 |
| Figure E.3 – Graphic construction of $F_1$ and $F_2$ .....                       | 49 |
| Figure E.4 – Graphic construction of $F_1$ , $F_{11}$ , $F_{21}$ and $F_2$ ..... | 51 |
| Figure E.5 – Graphic representation of OTDR ORL measurement.....                 | 53 |
| Figure E.6 – Graphic representation of reflectance measurement .....             | 54 |
| Figure F.1 – Return loss test set illustration .....                             | 56 |
| Figure F.2 – Measurement of the system internal attenuation $P_{ref2}$ .....     | 58 |
| Figure F.3 – Measurement of the system internal attenuation $P_{ref1}$ .....     | 58 |
| Figure F.4 – Measurement of the system reflected power $P_{rs}$ .....            | 58 |
| Figure F.5 – Measurement of the input power $P_{in}$ .....                       | 59 |
| Figure F.6 – Measurement of the reflected power $P_r$ .....                      | 59 |
| Figure G.1 – Return loss test set illustration .....                             | 61 |
| Figure G.2 – Measurement of $P_{rs}$ with reflections suppressed .....           | 62 |
| Figure G.3 – Measurement of $P_{ref}$ with reference reflector.....              | 62 |
| Figure G.4 – Measurement of the system reflected power $P_{rs}$ .....            | 63 |
| Figure G.5 – Measurement of the reflected power $P_r$ .....                      | 63 |
| Figure H.1 – Cabling configurations A, B and C tested with the OTDR method.....  | 68 |
| Figure H.2 – Cabling configuration D tested with the OTDR method.....            | 70 |
| Figure I.1 – Splice and macrobend attenuation measurement .....                  | 74 |
| Figure I.2 – Attenuation measurement with high reflection connectors .....       | 75 |
| Figure I.3 – Attenuation measurement of a short length cabling .....             | 76 |
| Figure I.4 – OTDR trace with ghost.....  | 77 |
| Figure I.5 – Cursor positioning .....  | 78 |
| Figure I.6 – Bi-directional OTDR trace display .....                             | 79 |
| Figure I.7 – Bi-directional OTDR trace attenuation analysis .....                | 80 |
| Figure J.1 – Obtaining reference power level $P_0$ .....                         | 83 |
| Figure J.2 – Obtaining power level $P_1$ .....                                   | 83 |
| Figure J.3 – Obtaining reference power level $P_0$ .....                         | 84 |
| Figure J.4 – Obtaining power level $P_1$ .....                                   | 84 |
| Figure J.5 – Obtaining reference power level $P_0$ .....                         | 85 |

Figure J.6 – Obtaining power level  $P_1$  ..... 85

Figure J.7 – Obtaining reference power level  $P_0$  ..... 86

Figure J.8 – Obtaining power level  $P_1$  ..... 87

Figure J.9 – Obtaining power level  $P_6$  ..... 87

Figure J.10 – Obtaining reference power level  $P_0$  ..... 88

Figure J.11 – Obtaining power level  $P_1$  ..... 88

Figure K.1 – Result of spectral attenuation measurement ..... 90

  

Table 1 – Cabling configurations ..... 18

Table 2 – Test methods and configurations ..... 21

Table 3 – Test limit adjustment and uncertainty related to test cord connector grade ..... 23

Table 4 – Uncertainty for given fibre length and attenuation at  
1 310 nm, 1 550 nm and 1 625 nm ..... 25

Table 5 – Uncertainty for a given fibre length at 1 310 nm and 1 550 nm using an  
OTDR ..... 26

Table 6 – Spectral requirements ..... 27

Table E.1 – Typical launch and tail cord lengths ..... 46

Table H.1 – Expected attenuation for examples ..... 65

Table H.2 – Test limit adjustment when using reference-grade test cords ..... 66

Table H.3 – Test limit adjustment when using reference-grade test cords – OTDR test  
method ..... 69

Table I.1 – Example of effective group index of refraction values ..... 73

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## **FIBRE-OPTIC COMMUNICATION SUBSYSTEM TEST PROCEDURES –**

### **Part 4-2: Installed cabling plant – Single-mode attenuation and optical return loss measurements**

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IEC 61280-4-2 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 third edition cancels and replaces the second edition published in 2014. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) addition of the equipment cord method;
- b) addition of test limit adjustment related to test cord grades;
- c) refinements on measurement uncertainties.

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

| Draft         | Report on voting |
|---------------|------------------|
| 86C/1912/FDIS | 86C/1916/RVD     |

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](http://www.iec.ch/members_experts/refdocs). The main document types developed by IEC are described in greater detail at [www.iec.ch/publications](http://www.iec.ch/publications).

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## INTRODUCTION

This document is part of a series of IEC standards for measurements of installed fibre optic cabling plants. This document is applicable for the measurement of installed single-mode fibres.

Cabling design standards such as ISO/IEC 11801-1 provide general requirements for this type of cabling. These standards support cabling lengths of up to 2 km for commercial premises and data centres and up to 10 km for industrial premises. ISO/IEC 14763-3, which supports ISO/IEC 11801-1, normatively references IEC 61280-4-2.

Various recommendations from ITU-T have requirements for longer distance applications, including short haul (40 km), long haul (80 km), and ultra-long haul (160 km). The testing of cabling plant for these applications is covered in ITU-T Recommendation G.650.3, which refers to the test methods of this document.

## **FIBRE-OPTIC COMMUNICATION SUBSYSTEM TEST PROCEDURES –**

### **Part 4-2: Installed cabling plant – Single-mode attenuation and optical return loss measurements**

#### **1 Scope**

This part of IEC 61280 is applicable to the measurements of attenuation and optical return loss of an installed optical fibre cabling plant using single-mode fibre. This cabling plant can include 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.

This document is applicable to all single-mode fibre types including those designated by IEC 60793-2-50 as Class B fibres.

The principles of this document can be applied to cabling plants containing branching devices (splitters) and at specific wavelength ranges in situations where passive wavelength selective components are deployed, such as WDM, CWDM and DWDM devices.

This document is not intended to apply to cabling plants that include active devices such as fibre amplifiers or dynamic channel equalizers.

#### **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 60825-2, *Safety of laser products – Part 2: Safety of optical fibre communication systems (OFCSs)*

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 TR 62627-01, *Fibre optic interconnecting devices and passive components – Part 01: Fibre optic connector cleaning methods*