

INTERNATIONAL STANDARD

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First edition
2006-06

**Information technology –
Implementation and operation of
customer premises cabling –**

**Part 3:
Testing of optical fibre cabling**

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**INFORMATION TECHNOLOGY –
IMPLEMENTATION AND OPERATION OF
CUSTOMER PREMISES CABLING –
Part 3: Testing of optical fibre cabling**

FOREWORD

- 1) ISO (International Organization for Standardization) and IEC (International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards. Their preparation is entrusted to technical committees; any ISO and IEC National Committee interested in the subject dealt with may participate in this preparatory work. International governmental and non-governmental organizations liaising with ISO and IEC also participate in this preparation.
- 2) In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.
- 3) All users should ensure that they have the latest edition of this publication.
- 4) No liability shall attach to IEC or ISO or its directors, employees, servants or agents including individual experts and members of their technical committees and IEC or ISO member bodies for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication of, use of or reliance upon, this ISO/IEC publication or any other IEC, ISO or ISO/IEC publications.
- 5) Attention is drawn to the normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights.

ISO/IEC 14763-3 has been prepared by subcommittee 25: Interconnection of information technology equipment, of ISO/IEC joint technical committee 1: Information technology.

This International Standard replaces ISO/IEC TR 14763-3, first edition, published in 2000, and constitutes a technical revision.

This standard incorporates innovations and recent developments including guidance in the proper use of uni-directional and bi-directional OTDR testing, the three-jumper method as default test method, fibre end-face inspection and criteria for scratches, return loss values for SC and non-SC connectors and the normative use of reference connectors. However, the most substantial change is the application of the 2 parameters which are used to determine the two repeatable multimode launch conditions “modal power distribution” and “coupled power ratio”.

This International Standard has been approved by vote of the member bodies, and the voting results can be obtained from the address given on the title page.

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

INTRODUCTION

This document is one of three prepared in support of International Standard ISO/IEC 11801.

Figure 1 below shows the inter-relationship between ISO/IEC 11801, these associated Technical Reports/Standards and other related standards.

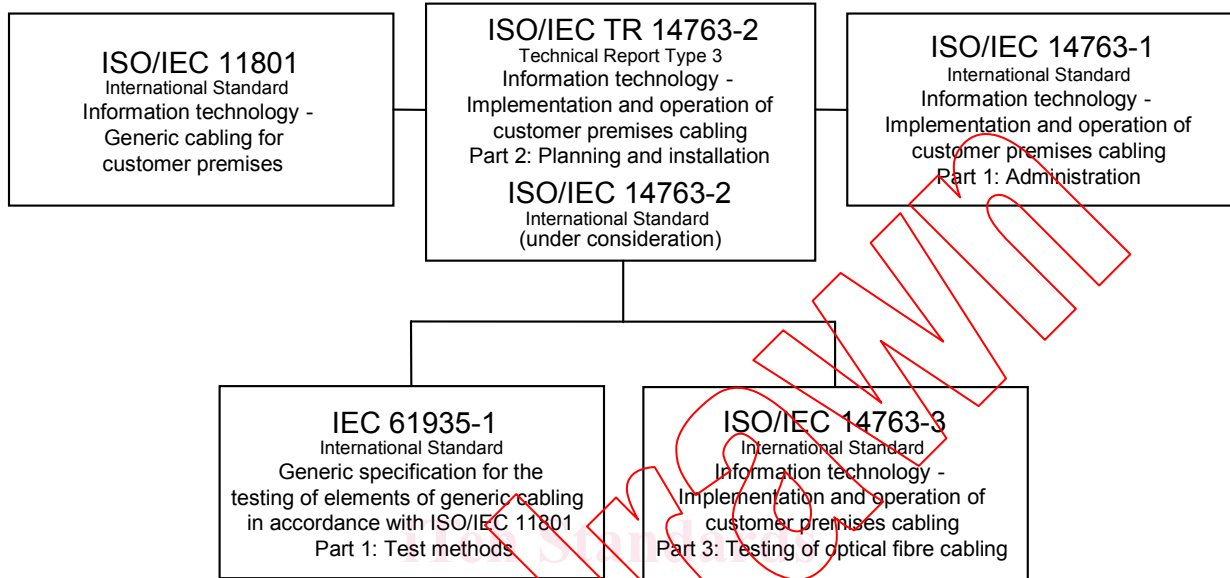


Figure 1 – Document relationships

<https://standards.iteh.ai/> Part 3 of ISO/IEC 14763 details inspection and test procedures for optical fibre cabling <https://standards.iteh.ai/standards/ISO/IEC/14763-3-2006>

- designed in accordance with ISO/IEC 11801 and equivalent standards and
- installed according to the requirements and recommendations of ISO/IEC 14763-2 (under consideration).

Users of this International Standard should be familiar with both ISO/IEC 11801 and ISO/IEC 14763-2.

The quality plan for each installation will define the acceptance tests and sampling levels selected for that installation. Requirements and recommendations for the development of a quality plan are described in ISO/IEC 14763-2 (under consideration).

INFORMATION TECHNOLOGY – IMPLEMENTATION AND OPERATION OF CUSTOMER PREMISES CABLING –

Part 3: Testing of optical fibre cabling

1 Scope

This part of ISO/IEC 14763 specifies systems and methods for the inspection and testing of optical fibre cabling designed in accordance with ISO/IEC 11801 or equivalent standards. The test methods refer to existing standards-based procedures where they exist.

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.

ISO/IEC 11801, *Information technology – Generic cabling for customer premises*

ISO/IEC TR 14763-2, *Information technology – Implementation and operation of customer premises cabling – Part 2: Planning and installation*¹

IEC 60050-731, *International Electrotechnical Vocabulary – Chapter 731: Optical fibre communication*

IEC 60793-1-20, *Optical fibres – Part 1-20: Measurement methods and test procedures – Fibre geometry*

IEC 60793-1-45, *Optical fibres – Part 1-45: Measurement methods and test procedures – Mode field diameter*

IEC 60793-2-10, *Optical fibres – Part 2-10: Product specifications – Sectional specification for category A1 multimode fibres*

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

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

IEC 60874-14-1, *Connectors for optical fibres and cables – Part 14-1: Detail specification for fibre optic connector type SC/PC standard terminated to multimode fibre type A1a, A1b*

IEC 60874-14-2, *Connectors for optical fibres and cables – Part 14-2: Detail specification for fibre optic connector type SC/PC tuned terminated to single-mode fibre type B1*

IEC 60874-14-3, *Connectors for optical fibres and cables – Part 14-3: Detail specification for fibre optic adaptor (simplex) type SC for single-mode fibre*

IEC 60874-19, *Connectors for optical fibres and cables – Part 19: Sectional specification for fibre optic connector – Type SC-D(uplex)*

¹ ISO/IEC 14763-2 is planned to become an International Standard.

IEC 60874-19-1, *Connectors for optical fibres and cables – Part 19-1: Fibre optic patch cord connector type SC-PC (floating duplex) standard terminated on multimode fibre type A1a, A1b - Detail specification*

IEC 60874-19-2, *Connectors for optical fibres and cables – Part 19-2: Fibre optic adaptor (duplex) type SC for single-mode fibre connectors – Detail specification*

IEC 61300-3-1, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 3-1: Examinations and measurements – Visual examination*

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

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

IEC/PAS 61300-3-43, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 3-43: Examination and measurements – Mode Transfer Function Measurement for fibre optic sources*

3 Definitions and abbreviations

3.1 Definitions

For the purposes of this document the following definitions apply in addition to those of ISO/IEC 11801 and IEC 60050-731.

3.1.1 adapter

device that enables interconnection between terminated optical fibre cables

3.1.2 cabling interface adapter

test cords and other components used to connect test equipment to the cabling under test

3.1.3 connection

mated device or combination of devices including terminations connecting two cables or cable elements

3.1.4 cable sheath

covering over the optical fibre or conductor assembly that may include one or more metallic members, strength members or jackets

3.1.5 coupled power ratio (CPR)

ratio of power coupled in a MMF to the power coupled in SMF which is related to the modal power distribution of the light in MMF

3.1.6 fail result

measured value which fails to meet the specified requirement and where the absolute value of the difference between the measured value and the specified requirement is greater than the stated measurement uncertainty

3.1.7**field calibration cord**

test cord used for referencing when using the 3-jumper test method

3.1.8**marginal result**

measured value which differs from the specified requirement by an amount not exceeding the stated measurement uncertainty

3.1.9**multimode optical fibre (MMF)**

optical fibre which supports multiple paths of light transmission

3.1.10**optical fibre**

any filament made of dielectric materials that guides light

3.1.11**optical time domain reflectometer (OTDR)**

instrument used to characterise optical fibre cabling by measuring the backscatter and reflection of injected light pulses as a function of time

3.1.12**pass result**

measured value which meets the specified requirement and where the absolute value of the difference between the measured value and the specified requirement is greater than the stated measurement uncertainty

3.1.13**reference connector**

tighter tolerances or selected connector component which is used for measuring purposes

NOTE The characteristics or selection procedures are given in the relevant connecting hardware specification.
[IEC 60874-1, 1.3.14, modified]

3.1.14**relative power distribution**

metric used to determine launch conditions in terms that are relative to a light source's overall launched power

3.1.15**sheath**

see cable sheath

3.1.16**single-mode optical fibre (SMF)**

optical fibre which supports only one mode of light transmission

3.1.17**test cord**

cable assembly used either to connect test equipment to the cabling under test or as part of a test reference measurement

3.1.18**test operator**

skilled person testing in accordance with instructions provided by the test system designer

3.1.19

test system

test equipment and cabling interface adapters necessary to undertake a given test/measurement in accordance with the requirements of this standard





3.2 Abbreviations

For the purposes of this document the following abbreviations apply in addition to those of ISO/IEC 11801 and IEC 60050-731.

APC	Angled physical contact
CPR	Coupled power ratio
IOR	Index of refraction
LMD	Launched modal distribution
LSA	Least squares average
LSPM	Light source and power meter
MMF	Multimode optical fibre
MPD	Modal power distribution
na	not applicable
OTDR	Optical time domain reflectometer
RPD	Relative power distribution
SMF	Single-mode optical fibre

3.3 Symbols

For the purposes of this document the following symbols apply.

	Optical fibre connector (general)
	Optical fibre connector on installed cabling
	Optical fibre connector with reference termination
	Joint

4 Conformance

To test installed cabling according to this International Standard:

- the general requirements of clauses 5 and 8 shall be met;
- the test equipment and test cords shall conform to the requirements of Clause 6;
- the test method, as appropriate, and treatment of results shall conform to Clauses 9 and 10;
- the test results shall be documented in accordance with 5.4;
- the requirements of IEC 60825-2 shall be met.

To inspect installed cabling according to this International Standard:

- the inspection equipment shall conform to the requirements of Clause 7;
- the inspection method, as appropriate, shall conform to Clause 11;
- the requirements of IEC 60825-2 shall be met.

Relevant national and local regulations covering safe working practices shall be observed.