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SERIES L: CONSTRUCTION, INSTALLATION AND
PROTECTION OF CABLES AND OTHER ELEMENTS OF
OUTSIDE PLANT

Optical fibre cables for drop applications

Recommendation ITU-T L.87



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Recommendation ITU-T L.87

Optical fibre cables for drop applications

Summary

Recommendation ITU-T L.87 describes the characteristics, construction and test methods of optical fibre cables for drop applications. Optical fibre drop cables are used to connect customer and optical access networks. Access points may be located both outdoors or indoors, depending on the access network configuration. When access points are located outdoors, optical drop cables are exposed to both outdoor and indoor environments. In this case the optical drop cable should be designed for both environments.

This Recommendation also describes the characteristics that a cable requires for an optical fibre to perform appropriately. Moreover, a method is described for determining whether or not the cable has the required characteristics. The required conditions may differ according to the installation environment; detailed test conditions must be agreed upon between the user and manufacturer as regards the environment in which the cable is to be used (in case of applying small bends during and after installation, especially).

History

Edition	Recommendation	Approval	Study Group
1.0	ITU-T L.87	2010-07-29	15

FOREWORD

The International Telecommunication Union (ITU) is the United Nations specialized agency in the field of telecommunications, information and communication technologies (ICTs). The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of ITU. ITU-T is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

The World Telecommunication Standardization Assembly (WTSA), which meets every four years, establishes the topics for study by the ITU-T study groups which, in turn, produce Recommendations on these topics.

The approval of ITU-T Recommendations is covered by the procedure laid down in WTSA Resolution 1.

In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

NOTE

In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

Compliance with this Recommendation is voluntary. However, the Recommendation may contain certain mandatory provisions (to ensure, e.g., interoperability or applicability) and compliance with the Recommendation is achieved when all of these mandatory provisions are met. The words "shall" or some other obligatory language such as "must" and the negative equivalents are used to express requirements. The use of such words does not suggest that compliance with the Recommendation is required of any party.

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As of the date of approval of this Recommendation, ITU had not received notice of intellectual property, protected by patents, which may be required to implement this Recommendation. However, implementers are cautioned that this may not represent the latest information and are therefore strongly urged to consult the TSB patent database at <http://www.itu.int/ITU-T/ipr/>.

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Optical fibre drop cables are used to connect the customer and optical access networks. For office users, conventional underground and aerial cables can be employed. However, household users usually require one or more fibre cables. Therefore, cables are often designed specifically for this purpose. Access points may be located both outdoors or indoors, depending on the access network configuration. When access points are located outdoors, optical drop cables are exposed to both outdoor and indoor environments. In this case, optical drop cables should be designed for both environments. The required characteristics may also differ from those of standard underground or aerial cables. This Recommendation has been developed to deal with this situation.

Recommendation ITU-T L.87

Optical fibre cables for drop applications

1 Scope

This Recommendation:

- refers to optical fibre cables to be mainly used for connecting a household customer and an optical access network;
- deals with the mechanical and environmental characteristics of optical fibre cables for drop applications. The optical fibre dimensional and transmission characteristics, together with their test methods, should comply with [ITU-T G.652] or [ITU-T G.657], which deal with single-mode optical fibres. When using multi-mode or plastic fibres, [IEC 60793-2-10] and [IEC 60793-2-40] are suitable standards, respectively;
- deals with fundamental considerations related to optical fibre cables from mechanical and environmental standpoints;
- acknowledges that some optical fibre cables may contain metallic elements, for which reference should be made to other L-series Recommendations;
- recommends that an optical fibre cable should be provided with cable end-sealing and protection during cable delivery and storage, as used for metallic cables. If splicing components have been factory installed they should be adequately protected.

2 References

The following ITU-T Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published. The reference to a document within this Recommendation does not give it, as a stand-alone document, the status of a Recommendation.

- [ITU-T G.650.1] Recommendation ITU-T G.650.1 (2010), *Definitions and test methods for linear, deterministic attributes of single-mode fibre and cable*.
- [ITU-T G.652] Recommendation ITU-T G.652 (2009), *Characteristics of a single-mode optical fibre cable*.
- [ITU-T G.657] Recommendation ITU-T G.657 (2009), *Characteristics of a bending-loss insensitive single-mode optical fibre and cable for the access network*.
- [ITU-T L.1] Recommendation ITU-T L.1 (1988), *Construction, installation and protection of telecommunication cables in public networks*.
- [ITU-T L.46] Recommendation ITU-T L.46 (2000), *Protection of telecommunication cables and plant from biological attack*.
- [IEC 60189-1] IEC 60189-1 (2007), *Low-frequency telecommunication cables and wires with PVC insulation and PVC sheath – Part 1: General test and measuring methods*.
- [IEC 60332-1] IEC 60332-1 (1979), *Tests on electric cables under fire conditions – Part 1: Test for vertical insulated wire or cable*.

- [IEC 60332-3-24] IEC 60332-3-24 (2000), *Test on electric cables under fire conditions – Part 3-24: Test for vertical flame spread of vertically-mounted bunched wires or cables – Category C.*
- [IEC 60754-1] IEC 60754-1 (1994), *Test on gases evolved during combustion of materials from cables – Part 1: Determination of the amount of halogen acid gas.*
- [IEC 60754-2] IEC 60754-2 (1991), *Test on gases evolved during combustion of electric cables – Part 2: Determination of degree of acidity of gases evolved during the combustion of materials taken from electric cables by measuring pH and conductivity.*
- [IEC 60793-1] IEC 60793-1 (2001), *Optical fibres – Part 1: Generic specification.*
- [IEC 60793-1-32] IEC 60793-1-32 (2001), *Optical fibres – Part 1-32: Measurement methods and test procedures – Coating strippability.*
- [IEC 60793-2-10] IEC 60793-2-10 (2007), *Optical fibres – Part 2-10: Product specifications – Sectional specification for category A1 multimode fibres.*
- [IEC 60793-2-40] IEC 60793-2-40 (2009), *Optical fibres – Part 2-40: Product specifications – Sectional specification for category A4 multimode fibres.*
- [IEC 60794-1-1] IEC 60794-1-1 (2003), *Optical fibre cables – Part 1-1: Generic specification – General.*
- [IEC 60794-1-2] IEC 60794-1-2 (2005), *Optical fibre cables – Part 1-2: Generic specification – Basic optical cable test procedures.*
- [IEC 61034-1] IEC 61034-1 (2005), *Measurement of smoke density of cables burning under defined conditions – Part 1: Test apparatus.*
- [IEC 61034-2] IEC 61034-2 (2005), *Measurement of smoke density of cables burning under defined conditions – Part 1: Test procedure and requirements.*
- [IEC/TR 62048] IEC/TR 62048 (2002), *Optical fibres – Reliability – Power law theory.*

3 Definitions

For the purpose of this Recommendation, the definitions given in [ITU-T G.650.1] apply.

4 Abbreviations and acronyms

None.

5 Conventions

None.

6 Characteristics of the optical fibres and cables

6.1 Optical fibres

6.1.1 Single-mode fibres

[ITU-T G.652] or [ITU-T G.657] should be used.

6.1.2 Multimode fibres

[IEC 60793-2-10] should be used.